MR310122

ROPES & GRAY LLP
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BOSTON NEW YORK PALO ALTO SAN FRANCISCO TOKYO WASHINGTON, DC www.ropesgray.com

December 4, 2007

Mark A. Greenwood
202-508-4605
mark.greenwood@ropesgray.com

Contains No CBI

BY FEDERAL EXPRESS

Mary Toro
U.S. Consumer Product Safety Commission
4330 East West Highway
Bethesda, MD 20814

8EHQ-08-17084

2008 FEB 25 P 2:51

RECEIVED

BY HAND

Julie Simpson
U.S. Environmental Protection Agency
1201 Constitution Avenue, N.W.
Mail Code 7404T
Washington, DC 20460

BY FEDERAL EXPRESS

Maureen Ruskin
Occupational Safety and Health Administration
200 Constitution Avenue, N.W.
Washington, DC 20210

8080000127

NOT TSCA CBI - PER JANUARY 7, 2008
SCOTT M. SHEMIOCK, CHIEF TSCA SECURITY.
SIGNED 2/26/08

[redacted]

Dear Mary, Julie and Maureen:

On behalf of the American Gaming Association (AGA), I am following up on my conversation with each of you last week concerning lead in gaming chips. As I explained, the members of AGA recently learned through a press report that Paulson gaming chips, which are commonly used in many major casinos, may contain significant levels of lead. Since then AGA has been attempting to obtain more information from the manufacturer of these chips, Gaming Partners International (GPI), and from state and local officials who have been evaluating the situation.

In our conversations, you all expressed interest in further information that may come to our attention. We are attaching a copy of a chart that we received from GPI, which describes the lead content of Paulson gaming chips organized by year of manufacture and chip color. While this information was not obtained under a specific confidentiality agreement, we do not know

whether GPI would consider this information "confidential business information." Pending clarification of this issue with GPI, we would ask you to treat it as such for the time being.

At this point, this is the only specific technical information that we have obtained related to lead in gaming chips. GPI has indicated that it is conducting further studies of the potential for exposure to lead from Paulson chips and plans to share that information with others in the industry. We also understand that health and occupational safety agencies in Arizona, Nevada and California have been collecting relevant data, but we have not seen that information.

AGA is providing this information in the interest of keeping you informed on this matter. At this point, it appears that state and local agencies are taking a lead role in evaluating the health implications, if any, presented by use of gaming chips. While we are providing this information to all three federal agencies with a potential interest in this topic, please let us know if you think further information on this topic should be directed to one or more of your agencies, or should be conveyed exclusively to appropriate state and local agencies.

Thank for your advice and assistance in this matter.

Respectfully submitted,

Mark A. Greenwood

MAG:
Attachment

PAULSON CHIPS' COLORS HISTORY

AS OF NOVEMBER, 12 2007

LINE	CHIP COLORS	BEFORE	Jan-98	1998	1999	2000	2001	2002	2003	2004	2005	1to11 06	11-6 10-7	07	2008
1	1														
2	2														
3	3														
4	4														
5	5														
6	6														
7	7														
8	8														
9	9														
10	10														
11	11														
12	12														
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65	65														
66	66														
67	67														
68	68														
69	69														
70	70														
71	71														
72	72														
73	Blurple														
74	Day Green														
75	Fuschia														
76	Indian Blue														
77	Metallic Gold														
78	Metallic Silver														

MAXIMUM LEAD CONTENT, ALL SOURCES		
%	PPM	ILLUSTRATION
47.0000%	470,000	
0.5000%	5,000	
0.0030%	30	
0.0000%	0	

this means in a chip of :

9.70	grams

the amount of lead is:

4.55900	grams
0.04850	gram
0.00029	gram
0.00000	gram

or in ounces

0.34	oz
0.1608	oz
0.0017	oz
0.0000103	oz
0.0000000	oz

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BOSTON NEW YORK PALO ALTO SAN FRANCISCO TOKYO WASHINGTON, DC www.ropesgray.com

January 7, 2008

Mark A. Greenwood
202-508-4605
mark.greenwood@ropesgray.com

BY ELECTRONIC AND U.S. MAIL

CONTAIN NO CBI

Scott M. Sherlock
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
Mail Code 7408M
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Scott:

On December 4, 2007 our office sent to the Environmental Protection Agency ("EPA"), on behalf of the American Gaming Association ("AGA"), a letter conveying certain information that had come to our attention about the lead content of a consumer product. At the time we claimed the information in the letter as Confidential Business Information ("CBI"). You have recently asked us whether AGA intends to maintain this claim.

As we discussed, the circumstances leading to this claim are somewhat unique. The information at issue came to the members of AGA from a salesman for the manufacturer of the consumer product. At the time we submitted the information to EPA, we were not sure whether that manufacturer considered the data to be CBI. The document containing the information was not marked as trade secret information, and we were not, and are not, aware of any confidentiality agreements between the manufacturer and its customers intended to protect the information.

AGA does not view the document nor the information within the document, as CBI. We simply placed the CBI claim on the document to protect it from disclosure pending a clarification from the manufacturer on its view of its CBI status. We shared a copy of the letter with the manufacturer on December 7, 2007, but have not received a clarification of the company's perspective.

By this letter, AGA is withdrawing its CBI claim for the letter and attachment submitted to the Agency on December 4, 2007.

I hope this will assist your decisions on proper filing of the document. Please let me know if I can answer any questions, and thank you for your attention to this matter.

Sincerely,

Mark A. Greenwood

Scott Sherlock/DC/USEPA/US
01/07/2008 01:14 PM

To Sineta Wooten/DC/USEPA/US@EPA, Ronald Morony/DC/USEPA/US@EPA, Maria Doa/DC/USEPA/US@EPA, Brian
cc
bcc
Subject American Gaming Association filing of December 4, 2007 concerning lead content in chips. CBI claim clarified and removed.

History: This message has been replied to.

Please see the below referenced note and attachment from Mark Greenwood representing the American Gaming Association. To my mind it is OK if you decide to treat the December mailing as non-CBI. If you decide to do this please physically attach a copy of this email and the pdf of the letter to the original mailing.

Scott M. Sherlock, Attorney Advisor
Environmental Assistance Division
Office of Pollution Prevention and Toxics
202.564-8257 (telephone)
202.564-8251 (facsimile)
sherlock.scott@epa.gov (e-mail)
----- Forwarded by Scott Sherlock/DC/USEPA/US on 01/07/2008 01:07 PM -----

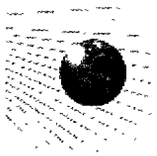
"Greenwood, Mark A." <Mark.Greenwood@ropesgray.com>
Sent by: "Hardy, Catherine H." <Catherine.Hardy@ropesgray.com>

01/07/2008 11:58 AM

To Scott Sherlock/DC/USEPA/US@EPA
cc
Subject American Gaming Association

Attached please find a pdf of a letter dated today which is going out to you by regular U.S. mail, per your request.

Letter to Scott Sherlock.pdf



Scott Sherlock/DC/USEPA/US
01/22/2008 07:51 AM

To Maria Doa/DC/USEPA/US@EPA, Brian Symmes/DC/USEPA/US@EPA, Ronald Morony/DC/USEPA/US@EPA, Sineta
cc
bcc
Subject Lead in Gaming Chips matter. RESPONSE from Gaming Partners International Corporation - Paulson Gaming Chips to GREENWOOD submission

Below is the response from counsel to the Gaming Partners International Corporation to the submission from the American Gaming Association ("AGA") represented by Mark Greenwood.

I might suggest that the below email and the Greenwood submission be directed to IMD for inclusion in the TSCA public dockets as either 8(e)s or FYIs.

Is there any outside press or any other folks expressing interest in this subject?

Scott M. Sherlock, Attorney Advisor
Environmental Assistance Division
Office of Pollution Prevention and Toxics
202.564-8257 (telephone)
202.564-8251 (facsimile)
sherlock.scott@epa.gov (e-mail)
----- Forwarded by Scott Sherlock/DC/USEPA/US on 01/22/2008 07:44 AM -----

"Allen, John" <jallen@allenmatkins.com>
01/18/2008 08:11 PM

To Scott Sherlock/DC/USEPA/US@EPA
cc
Subject Gaming Partners International Corporation - Paulson Gaming Chips

Sherlock,

Thank you for taking the time to talk briefly with me earlier this week regarding this matter. By all means, feel free to circulate and discuss the chart that was included in the correspondence you received from Mark Greenwood. As you know, his firm represents the American Gaming Association ("AGA") which I understand is a trade association of gambling casino owners and operators.

As I indicated:

- Our firm represents Gaming Partners International Corporation and its affiliates ("GPI");
- GPI manufactures gaming equipment and products including a line of gaming chips referred to as the Paulson chip which are sold to all major casinos including many AGA members;.
- In June 2006, GPI received notice from the Center for Environmental Health ("CEH"), a private environmental advocacy group in California, indicating CEH intended to bring suit there against GPI because CEH had determined that some of the GPI poker chips previously made by GPI or its predecessor contained lead and/or lead compounds (lead and lead compounds are "Listed Chemicals" under that state's Safe Drinking Water and

Toxic Enforcement Act of 1986, commonly referred to as Proposition 65);

- While GPI was pursuing settlement discussions with CEH, a local ABC Affiliate in Phoenix contacted CEH and decided to air a news story there on GPI which essentially alleged that many of the Paulson chips had high lead content and posed health risks by means of dust exposure and potential hand-to-mouth transfer;
- In response to the news story and subsequent concerns raised by GPI's customers and Arizona regulators, GPI retained Exponent, a leading environmental consulting group to develop a study of its gaming chips;
- The Exponent study, a copy of which is attached, found no basis whatsoever for the accusations and innuendo in the ABC news story and GPI's local counsel is now in discussions with ABC seeking a retraction, and the company is meeting with GPI's own customers (i.e. major and minor licensed casinos across the country) to allay their concerns;
- GPI and Exponent are continuing to present to others the data on the gaming chips and the results of protocol testing all of which indicate that intended and routine use of these chips does not pose any threat to anyone including casino dealers and cashiers and patrons; and
- GPI's own testing of its own employees who manufacture the chips from dry powders (including periodic blood lead testing) has shown no indication of elevated blood lead levels resulting from their routine handling of the raw materials

We are frankly puzzled as to why Mr. Greenwood elected to send EPA, OSHA and CPSC his letter in early December. At the time he sent his letter, his firm was clearly aware that we had completed our initial testing and were in discussions with AGA members regarding their concerns triggered by the ABC news story. We had already arranged to present to AGA the Exponent study results and did on December 7, 2007 at a meeting in which Mr. Greenwood was present by telephone. In the interval, we have been working with AGA member casinos to further confirm that use of the gaming chips poses no risk and respond to lingering concerns and questions.

With respect to TSCA sec. 8(e) concerns, I wish to assure EPA that GPI has no information to suggest that its Paulson gaming chip or any of its other products presents a substantial risk of injury to health or the environment. The opposite is true. Not only does GPI not have such information, in response to the poorly researched ABC news segment and its unfounded accusations, GPI commissioned a thorough evaluation of its gaming chips that has found no indication of any risk of injury to health or the environment associated with the intended use of its product.

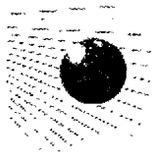
The ABC news segment resulted in a substantial "knee jerk" from state and local regulatory agencies who were concerned that there might be some truth behind the news story. In lieu of seeking scientific or technical information from the company, for example, the state of Arizona issued its own news release that appeared to embrace the unsupported allegation in the ABC story. When ABC subsequently withdrew further broadcast of the story at GPI's demand, and we met with Arizona, the state then posted a revised news release retreating from its original position. GPI has gone through and continues to go through substantial effort to rehabilitate its damaged reputation. The company understands that EPA and CPSC have a duty to respond to inquiries and concerns product safety concerns. We are asking, in turn, that you do so in a measured manner and understand that GPI has investigated and responded and is continuing to

respond to those concerns.
We further wish to assure you that we have no evidence from our own investigation or that of others to suggest in any way that any of our gaming chips or other gaming products pose an unreasonable risk to human health and safety or the environment. To the contrary, all the information available to GPI indicates that all our products are safe for their intended use.
If you have questions regarding this matter, please contact me at your convenience. GPI and I thank you again for taking the time to discuss this matter with me.

Regards,

John

John J. Allen
Allen Matkins Leck Gamble Mallory & Natsis LLP
515 South Figueroa Street, 7th Floor
Los Angeles, CA 90071-3398
Dir Dial: 213-955-5548
Fax: 213-620-8816
email: jallen@allenmatkins.com



Scott Sherlock/DC/USEPA/US
01/24/2008 08:40 AM

To Maria Doa/DC/USEPA/US@EPA, Brian Symmes/DC/USEPA/US@EPA, Ronald Morony/DC/USEPA/US@EPA, Sineta
cc
bcc
Subject Fw: Exponent Report on GPI Gaming Chips

Follow up to previous emails--the report itself.

Scott M. Sherlock, Attorney Advisor
Environmental Assistance Division
Office of Pollution Prevention and Toxics
202.564-8257 (telephone)
202.564-8251 (facsimile)
sherlock.scott@epa.gov (e-mail)
----- Forwarded by Scott Sherlock/DC/USEPA/US on 01/24/2008 08:38 AM -----

"Allen, John" <jallen@allenmatkins.com>
01/22/2008 11:02 AM

To Scott Sherlock/DC/USEPA/US@EPA
cc
Subject FW: Exponent Report on GPI Gaming Chips

Sherlock,

Here's the Exponent Report to which I referred in my e-mail to you on Friday. My apologies. I thought I'd already attached it.

Regards,

John

John J. Allen
Allen Matkins Leck Gamble Mallory & Natsis LLP
515 South Figueroa Street, 7th Floor
Los Angeles, CA 90071-3398
Dir Dial: 213-955-5548
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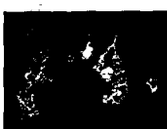
any attachments) is not intended or written to be used or relied upon, and cannot be used or relied upon, for the purpose of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or matter addressed herein.

Gaming Chip Study_Menlo Park.pdf



Exponent®

Evaluation of Potential Exposure to Lead in Gaming Chips

Exponent

Evaluation of Potential Exposure to Lead in Gaming Chips

Prepared for

Gaming Partners International Corporation
1700 S. Industrial Road
Las Vegas, Nevada 89102

Prepared by

Exponent
500 12th Street, Suite 220
Oakland, CA 94607

January 3, 2008

Doc. ID: 0703377.000 A0T0 0108 EG02

Contents

List of Tables

1 Introduction

Gaming Partners International Corporation ("GPI") retained Exponent to independently evaluate and characterize the potential lead exposure to dealers and players during normal use and handling of the Paulson line of gaming chips that are sold and distributed by GPI's subsidiary, Gaming Partners International USA, Inc. ("GPI-USA"). In addition, Exponent was requested to evaluate the claims reported in an ABC-15 television news segment that aired on or about November 8, 2007, regarding the safety of use of the Paulson line of gaming chips. Exponent was further requested to respond to the health and safety concerns raised following the news segment by many of GPI-USA's customers, as well various state regulatory agencies, including the Arizona Department of Health Services ("ADHS"). In that regard, Exponent developed a protocol to simulate the potential for exposure to lead from the normal and intended use of the Paulson gaming chips.

Lead is ubiquitous in our environment. It is present in soil, water, air, and a wide variety of consumer products, making exposure to some amount of lead inevitable and unavoidable. The potential for lead, as with all chemicals in the environment, to adversely affect health depends on:

- The form of lead present
- The exposure pathway—that is, whether the lead is inhaled, touched, or ingested
- The magnitude and duration of the lead exposure.

Examples of lead exposure pathways include touching surfaces covered with lead dust and then transferring the dust to the mouth with the fingers, inhaling lead-containing dust in air or fumes from soldering, swallowing lead paint chips, drinking water distributed through lead pipes or at hot temperatures through faucets and fixtures made from lead alloys, and inhalation during burning of lead-painted wood (ATSDR 2007).

There is no obvious significant route of exposure for dealers or players handling lead-containing gaming chips. Under reasonably foreseeable use of the gaming chips, the chips do not emit lead vapors or generate lead particles that are sufficiently small to become airborne and be inhaled. In addition, skin contact with lead is not known to affect the health of exposed individuals, because lead does not easily penetrate the skin under normal conditions (ATSDR 2007).
A potential route of exposure is incidental ingestion associated with fingertip-to-mouth contact. This route is dependent on a transfer of lead from chips to the fingertips and subsequent fingertip-to-mouth contact, where the lead is dislodged and swallowed. However, finger-to-mouth events that are common for young children are not common for most adults. With these considerations in mind, Exponent evaluated the two most plausible pathways—incidental ingestion of lead from fingertips, and inhalation of dust released from the chips. The sampling program focused on wipe sampling of dealer and player fingertips to evaluate the potential for transfer of lead from the gaming chips to fingertips while handling gaming chips, and sampling

air at the breathing height of players and dealers throughout the duration of the study to evaluate potential inhalation exposure. This report describes the exposure simulation that was conducted for lead-containing gaming chips and presents study results.

2 Simulation and Sampling Methodology

2.1 Background

An ABC-15 television news story that aired on November 8, 2007, in the Phoenix, Arizona, area alleged that Paulson gaming chips sold and distributed by GPI-USA contained high levels of lead and that using the chips would result in exposure to unsafe levels of lead as a result of:

- Inhalation by players and casino dealers of particles that may be released from the chips, and/or
- Ingestion of lead-containing dust as a result of touching the chips while dealing and playing with them.

The television segment was subsequently aired elsewhere around the United States and prompted various regulatory agencies, including the Arizona Department of Health Services, to raise concerns and issue health alerts, based on the news segments or limited sampling that identified lead as a component of the gaming chips.

2.2 Development of Simulation and Sampling Methodology

In response to the television segment and its aftermath, GPI retained Exponent to develop a test protocol to evaluate the allegations and address agency concerns associated with potential exposures of the dealers and players to lead while using Paulson gaming chips. The simulation and sampling methods are described in the "Protocol for Chip-Handling Study" (Attachment A). The protocol was designed to evaluate the inhalation and ingestion pathways of potential exposure by measuring lead in air and on participants' fingertips. Potential lead inhalation exposure was evaluated by monitoring air in the vicinity of the dealer and players during normal use of the gaming chips. Potential incidental ingestion of lead that may be transferred from the chips to the fingertips, and subsequently from the fingertip to the mouth via fingertip-to-mouth behavior (e.g., nail biting), was evaluated by measuring the amount of lead accumulation on the fingertips of the dealer and players after handling gaming chips. As noted below, Exponent then conducted the sampling and compared results with applicable or appropriate standards recommended by various federal health agencies.

2.3 Summary of Simulation Protocol

Exponent developed a simulation protocol to evaluate whether the use of Paulson gaming chips results in a health risk to those handling this product as intended. A professional casino dealer volunteer from GPI, along with 12 volunteer players from Exponent, participated in the exposure simulation study. A total of four one-hour Blackjack sessions were conducted using the same dealer and three different player volunteers for each session. The dealer and players

were first asked to wash their hands, and a background hand wipe sample was obtained to serve as a control that would ensure that the washing procedure was effective (i.e., there is no detectable lead on their hands to begin with). The dealers and players were then taken to a Blackjack table that included a rack of gaming chips, and they were asked to play Blackjack and handle the chips and cards as they normally would during the course of Blackjack card games in a casino setting. The dealer dealt and oversaw a game of Blackjack for one hour. The dealer was instructed to deal the games as if he were dealing in a casino. The players however, were asked to observe certain restrictions that would not be present in casino play, to ensure that lead accumulation on their fingertips would not be reduced by transfers from the fingers to other objects. Players were asked to not touch their hands to their hair, face, or clothing. In addition, no beverages were provided to the players during simulated play. These restrictions allowed us to make a conservative, "worst-case" estimate of lead accumulation on participants' fingertips.

The first session was conducted using Bud Jones plastic chips, which contain no added lead, to serve as a control. The three subsequent sessions were played with Paulson chips that contained lead at concentrations ranging from approximately 10,000 ppm (1%) to approximately 414,000 ppm (41%) based on chemical analyses. The calculated value based on the formula for the chip is 470,000 ppm (47%) lead. The difference between the analytical content result and manufacturing specification for lead for this chip is likely the result of lead that remains bound to other materials even after an aggressing acid digestion and extraction process. These chips bore an inlay or decal image reading "Viva Las Vegas" and were white, red, canary yellow, and metallic gold in color, as illustrated in Attachment B.

Based on x-ray fluorescence (XRF) measurements conducted by Exponent prior to the study, the four colors of chips were segregated into low (approximately 10,000 ppm; red chip), medium (approximately 20,000–50,000 ppm; white and yellow), and high (approximately 400,000 ppm; gold) lead content.

In the second and third rounds, the dealer provided players with only one color of chip per player (i.e., red, white, or gold), and the players handled only those chips throughout each session. The dealer handled all three colors of chips. The third round was broken into two half-hour sessions (3a and 3b), between which the players' hands were wiped and cleaned. Each of the three players handled only chips of one of the three colors during the first half-hour, and chips of a different color for the second half-hour. For the fourth round, chips of two different colors, representing low and medium lead content (red and yellow, respectively), were used by all players and the dealer.

After each session, wipe samples of the dealer's and players' fingertips were collected to remove lead that was transferred to the fingertips. Wipe samples were collected from the distal portion of the fingertips and thumbs of both hands using three consecutive wipes. All wipes were submitted to a laboratory for lead analysis. Additionally, product wipes were collected and analyzed, and the total lead content of each color chip used in the study was determined. All volunteers were instructed on the protocol and signed a consent agreement prior to participating in the study. Exponent's internal review board (IRB) approved the use of volunteers in this study prior to finalizing the study protocol.

In addition to background hand-wipe samples, technicians obtained method blanks and wipes of gloves worn by the sampler. All wipe samples were placed directly into digestion tubes supplied by the laboratory, which were placed in pre-labeled resealable plastic bags and submitted under standard chain-of-custody procedures to an accredited laboratory for preparation and analysis.

Lead was extracted from the wipe samples according to EPA Method 3050 Modified (acid digestion), with subsequent lead content analysis by EPA Method 6020 (inductively coupled plasma mass spectrometry [ICP-MS]). The limit of detection was 0.1 μg/wipe.

Air samples were collected for the duration of all four Blackjack sessions (approximately 6 hours), to represent a daily or 8-hour time-weighted average exposure. Air samples were collected using a two-piece filter holder cassette with a 0.8-micrometer (μm) cellulose ester membrane filter and sampling pumps. Two samplers were placed on each side of the dealer at the dealer's breathing-zone height. An additional sampler was placed near the players, at their breathing-zone height. The air samples were collected as area samples, rather than personal samples, because the dealer and players remained in the same positions during the Blackjack sessions; therefore, the area samples provided representative data for potential dealer and player inhalation exposures that likely would not have differed substantially from personal samples. Samples were collected in accordance with NIOSH Method 7300 and analyzed by graphite furnace by an AIHA-accredited laboratory. Air-sampling pumps were calibrated prior to and after sampling. An outdoor background air sample and an indoor background air sample were also collected. A Certified Industrial Hygienist conducted the air sampling. The limit of detection was 0.03 $\mu g/m^3$.

3 Results

3.1 Lead Content and Fingertip Wipes

Table 1 summarizes the analytical results that provide the lead content for the chips used in the study. The lead content of the chips, based on laboratory digestion and extraction, ranged from 13,500 ppm to 414,000 ppm, and these concentrations were generally consistent with the initial XRF readings of the chips. The gold chip had the highest lead content, as was expected based on the XRF data. The measured lead concentrations in the product wipe samples ranged from 4.1 to 294 μg/wipe and generally correlated with the measured lead content of the chips. However, we note that the chip wipe sample results are poorly correlated with the fingertip wipe results reported below.

Table 2 summarizes the analytical results from the fingertip wipe samples, including the type of chips handled and the average lead result per fingertip for the dealers and each of the twelve players. The laboratory analytical data sheets for the wipe samples are included in Attachment C. Hand blank wipes for all rounds were non-detect (<0.1 μg/wipe), indicating that the washing procedure was effective, and there was no detectable lead on subjects' hands prior to playing Blackjack.[1] Method blanks and wipes of gloves worn by the sampler were also non-detect.

With the exception of one fingertip wipe result that reported a lead concentration near the analytical limit of detection, all fingertip wipe samples from Round 1—in which play was with Bud Jones plastic chips—were non-detect (<0.1 μg/wipe).[2] These non-detect results for Round 1 were expected, because this round served as a control round, using plastic chips. This result also confirms that other materials associated with the card game are not contributing a measurable amount of lead to the fingertips of the dealer or players.

A total of 45 fingertip wipe samples were collected during the remaining sampling rounds using chips that contained some lead (Rounds 2, 3a, 3b, and 4). The results from all three wipes for each subject were summed to produce an estimate of total lead accumulated on the fingertips. The average lead content per fingertip was determined by dividing the total wipe of 10 fingertips by 10, because typical adult finger-to-mouth contact is limited to a single finger. The results are as follows:

- The range and average amount of lead measured on the fingertips of the dealer handling lead-containing chips was 1.2 to 5.3 μg per fingertip, with an average of 3.6 μg per fingertip.

---

[1] A single exception was a hand blank from Round 3b, which appears to be anomalous, because subsequent fingertip results were low.

[2] The first fingertip wipe of one player was reported with a result of 0.215 μg/wipe. This measurement is close to the detection limit. The initial hand blank on this player was non-detect. The second and third wipe results for this player were non-detect.

- The range and average amount of lead measured on the fingertips of the players handling lead-containing chips was 0.24 to 14 μg per fingertip, with an average of 3.1 μg per fingertip.

When evaluated with respect to the lead content of the chip handled, the range and average amount of lead measured on the fingertips of the players are as follows:

- For the player using the red chips (low lead content), the range was 0.2 to 1.3 μg per fingertip, with an average of 0.6 μg per fingertip.
- For the player using the white chips (medium lead content), the range was 1.3 to 6.7 μg per fingertip, with an average of 3.2 μg per fingertip.
- For the player using the gold chips (high lead content), the range was 1.4 to 14.5 μg per fingertip, with an average of 7.5 μg per fingertip.

The highest amount of lead on the fingertips was associated with handling of the high-content gold chip, and the lowest amount on the fingertip was associated with the low-content red chip. However, these findings were not consistent for all rounds of sampling, most likely due to chip-handling variability among the players. The players were observed handling their chips in a variety of ways, including fingering the chips, rubbing the chip edges, and stacking the chips. Some players handled their chips more frequently than others. The observed handling activities represent the typical range of behaviors for players and dealers. In one session, it was noted that the average amount of lead per fingertip of players was greater after one hour of play than after one-half hour of play. However, this observation is based on a small number of samples, and there was wide variability in chip-handling behavior observed. It is also notable that all of the above estimates of fingertip accumulation are upper-bound estimates, because study participants were instructed not to touch their head or clothes during play, nor were they allowed to touch beverage containers as they might do under casino play conditions.

3.2 Air Sampling

The lead concentrations in the air samples collected from the breathing zones of the players and dealer, and in background samples, were reported as <0.03 $\mu g/m^3$ (Table 3). These values indicate that no measurable airborne lead was released during play, and that airborne lead levels at the gaming table were not different from background levels, with concentrations below the detection limit of the analytical method and, thus, substantially below the Occupational Safety and Health Administration (OSHA) standard of 50 $\mu g/m^3$ and the OSHA action level of 30 $\mu g/m^3$, as well as the ambient air standard of 1.5 $\mu g/m^3$.

4 Interpretation of Data

4.1 Consumer Product and Occupational Standards

Exponent reviewed various federal health and safety and environmental agencies' recommendations and standards regarding lead, including guidance from OSHA, the U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), and the American Conference of Governmental Industrial Hygienists (ACGIH).

Potential health effects of lead are evaluated by determining a daily amount of lead intake that ensures that lead in the blood does not exceed a particular target level. The target blood lead levels are different for children and adults, due to differences in body size and the manner in which lead is absorbed and eliminated by the bodies of adults and children. The American Conference of Governmental Hygienists (ACGIH) recommends a "Biological Exposure Index" (BEI) for lead of 30 micrograms of lead per deciliter of blood (30 μg/dL) for adult workers. Similarly, the OSHA "action level" for lead requires medical monitoring only if a worker's blood lead level exceeds 30 μg/dL. In addition, ACGIH recommends that women of childbearing age keep blood lead levels below 10 μg/dL to protect the developing fetus of a pregnant woman.

CPSC has issued guidance for lead in consumer products for children, based on a blood-lead target level for young children—10 μg/dL blood. The CPSC recommends that young children not chronically ingest more than 15 μg of lead per day from consumer products, and not more than 175 μg of accessible lead in a short period. CPSC has not issued guidance on lead in products used by adult consumers. The CPSC guidance values for children are not appropriate for adults because of differences in body size, differences in the way lead is absorbed and eliminated by the body, and differences in the types of effects reported in adults and children. Therefore, Exponent used a model developed by the U.S. EPA for assessing potential health effects from adults' exposure to lead (EPA's "Adult Lead Model"). This model allows us to estimate the blood-lead level that might be associated with potential OSHA workplace exposure (or various adult non-work-related exposures).

Exponent used the Adult Lead Model to estimate the daily amounts of lead that nearly all adults could ingest without causing blood-lead levels to go as high as 30 μg/dL (occupational criterion) or 10 μg/dL. The model takes into account normal background exposures to lead outside the workplace, such as drinking water, diet, and background air concentrations. Because different people may handle lead differently, we calculated maximum allowable daily intakes that protect even sensitive adults. These calculations assume that a person is exposed to lead on a chronic basis (i.e., 5 days per week, 50 weeks per year). Our results indicate the following:

- Adults would have to ingest more than 130 μg of lead per day to raise their blood-lead levels above the 30-μg/dL workplace target level
- A woman of child-bearing age would have to ingest more than 25 μg of lead per day to raise her blood-lead level above the 10-μg/dL recommended level.

4.2 Use of the Wipe-Sample Results for Exposure Assessment

The potential health significance of the lead measured on the fingertips of the dealer and players was assessed by estimating the number of fingertip contacts with the mouth that would be needed to exceed the adult occupational criterion for lead in blood (30 μg /dL), assuming that 100% of the lead on the fingertip is ingested, and the lead on the fingertip is "reloaded" by additional chip contact prior to the next mouth contact. This approach is conservative, because only a fraction of lead on the finger is likely to be released and swallowed during mouth contact, and contact of the fingertips with other objects (e.g. table, clothes, drink glass) also reduces the available amount of lead that could be transferred to the mouth.

The potential for lead exposure from handling of the gaming chips depends on several factors, including the lead content of the chip, the amount of lead that can be released from the chip, and chip-handling behavior. Key points in the assessment process include the following

- The detection of lead in a chip or from a product wipe sample does not equal exposure, nor can these types of measurements be used readily to estimate potential exposure.
- Potential, "worst-case" lead exposure can be characterized as the amount of lead on the parts of the hand that are likely to incidentally contact the mouth.
- Adult hand-to-mouth behavior primarily involves the fingertips.

With respect to the last point above, the fingertip wipe samples best represent the maximum amount of material available for hand-to-mouth activity (e.g., a fingertip up to the first joint being put into the mouth during nail biting or lip swiping, because an adult does not generally place the entire finger tip or more than one fingertip in his or her mouth at a time), if hand-to-mouth behavior occurs.

Ingestion of lead is assumed to result from swallowing a portion of the residue on the fingertips that was transferred to the mouth. The portion or percentage of lead transferred from the skin of the fingertip to the mouth as a result of inadvertent hand-to-mouth activity is likely to vary significantly with individual behavioral and hygiene practices. Few studies have been conducted to evaluate this factor. Our assessment does not consider routine hygienic practices or typical behaviors that reduce the amount of residual material that is potentially available for incidental hand-to-mouth transfer (e.g., contact with surfaces such as clothes, furniture, other body parts, that may reduce the amount available for dermal-to-oral transfer). Obviously, if only a fraction of the lead accumulated on the fingertips as the result of handling the chips is transferred to the mouth (e.g., 1% or 30%), then far more fingertip-to-mouth events could occur before the allowable level would be exceeded. This assessment assumes that all of the lead on a fingertip is transferred to the mouth during a single fingertip-to-mouth event, and that that amount of lead is again accumulated on the fingertip (i.e., reloaded) during additional chip contact and is again available to be transferred to the mouth during another touching event.

The exposure assessment is summarized in Table 4. Based on the study results, in order to raise his or her blood level above the 30-μg/dL occupational standard, an adult dealer would need to place a fingertip in his or her mouth 24 to 108 times (i.e., 24 to 108 reloading events) *during contact with the chips or before washing hands* (average of 54 times across all samples) and would need to:

- Ingest all the lead present on the fingertip each time,
- Repeatedly reload the same amount of lead onto the fingertips, and
- Do so consistently 5 days per week, 50 weeks per year.

Similarly, a player would need to place a fingertip in his or her mouth 9 to 530 times (i.e., 9 to 530 reloading events) *during contact with the chips or before washing hands* (average of 150 times across all samples) and would need to:

- Ingest all the lead present on the fingertip each time,
- Repeatedly reload the same amount of lead on fingertips, and
- Do so consistently 5 days per week, 50 weeks per year.[3]

With regard to a pregnant female, an adult dealer would need to place a fingertip in her mouth 5 to 21 times (i.e., 5 to 21 reloading events) *during contact with the chips or before washing hands* (average of 10 times per day) and ingest all the lead measured on the fingertip each time, and repeatedly reload lead on fingertips, to ingest enough lead to raise her blood-lead level above the 10-μg/dL value recommended for pregnant women (ACGIH 2007). This behavior would need to occur consistently, 5 days per week, 50 weeks per year. Similarly, a pregnant player would need to place a fingertip in her mouth 2 to 102 times (i.e., 2 to 102 reloading events) *during contact with the chips or before washing hands* (average of 29 times per day) and ingest all the lead on the fingertip each time, and repeatedly reload lead on fingertips over a time period of 5 days per week, 50 weeks per year, to raise her blood-lead level above 10 μg/dL.

4.3 Conclusions

Under the exposure scenarios evaluated, Exponent found no indication that the routine intended use of the Paulson gaming chips would result in any airborne exposure, let alone an exposure in excess of established OSHA airborne limits for lead. While routine handling of the Paulson gaming chips did release some lead to the fingertips of players and dealers, it is unlikely, even under the conservative assumptions employed, that handling of lead-containing gaming chips would expose players or dealers to lead at levels that would cause adult blood-lead levels to exceed the recommended value.

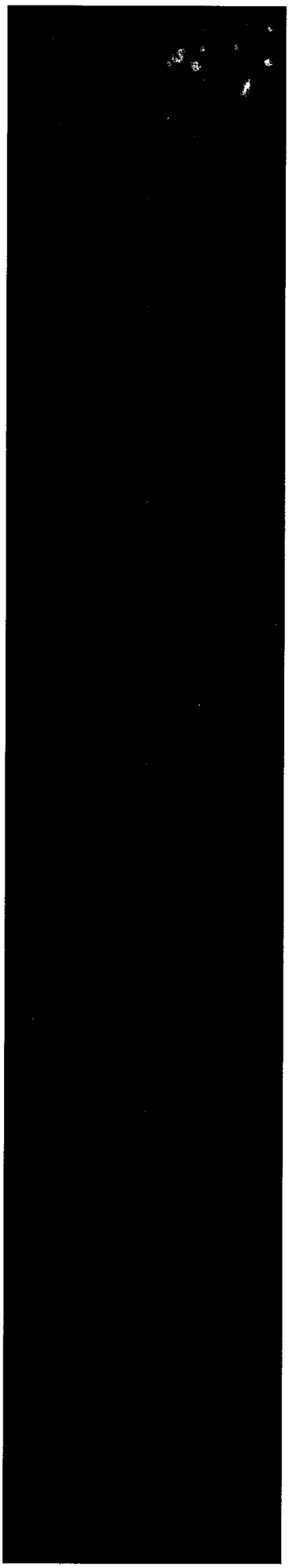
[3] There are no specific guidelines for adult blood-lead levels in the general public. However, since a player is likely to engage in chip-handling activities at a lower frequency than a dealer (i.e., less than 5 days per week for 50 weeks per year), comparison of data to the adult occupational guideline is reasonable.

5 References

ACGIH. 2007. TLVs and BEIs based on the documentation of the threshold limit values and biological exposure indices. American Conference of Governmental Industrial Hygienists. Signature Publications. ISBN: 978-1-882417-69-8.

ATSDR. 2007. Toxicological profile for lead. Agency for Toxic Substances Control and Disease Registry. August.

U.S. EPA. 2003. Recommendations of the Technical Review Workgroup for Lead for an approach to assessing risks associated with adult exposures to lead in soil. EPA-540-R-03-001.S. U.S. Environmental Protection Agency, Technical Review Workgroup for Lead 2003.



Tables

Table 1. Fingertip lead wipe results

Round	Subject	Chip	Hand Blank Wipe (µg)	Wipe 1 (µg)	Wipe 2 (µg)	Wipe 3 (µg)	Total Wipe (µg)	Average per Fingertip[a] (µg)
Round 1	Dealer	blank chip	<0.1	<0.100	<0.100	<0.100	ND	ND
Round 1	Player 1	blank chip	<0.1	0.215	<0.100	<0.100	ND	ND[b]
Round 1	Player 2	blank chip	<0.1	<0.100	<0.100	<0.100	ND	ND
Round 1	Player 3	blank chip	<0.1	<0.100	<0.100	<0.100	ND	ND
Round 2	Dealer	Gold/Red/White	<0.1	40.9	7.76	4.44	53.1	5.3
Round 2	Player 4	Gold	<0.1	106	28	11.2	145.2	14.5
Round 2	Player 5	Red	<0.1	10.5	1.81	0.682	12.992	1.3
Round 2	Player 6	White	<0.1	50.2	10.8	6.14	67.14	6.7
Round 3	Dealer	Gold/Red/White	<0.1	33.8	7.81	2.78	44.39	4.4
Round 3a	Player 7	Gold	<0.1	56.1	5.12	2.99	64.21	6.4
Round 3a	Player 8	Red	<0.1	1.88	0.387	0.183	2.45	0.2
Round 3a	Player 9	White	<0.1	9.74	2.06	0.882	12.682	1.3
Round 3b	Player 7	White	<0.1	12.7	2.84	1.64	17.18	1.7
Round 3b	Player 8	Gold	<0.1	9.59	3.3	1.32	14.21	1.4
Round 3b	Player 9	Red	5.9[c]	1.91	0.874	0.27	3.054	0.3
Round 4	Dealer	Red/Yellow	<0.1	9.32	1.34	1.33	11.99	1.2
Round 4	Player 10	Red/Yellow	<0.1	6.23	1.41	0.773	8.413	0.8
Round 4	Player 11	Red/Yellow	<0.1	6.53	1.9	0.6	9.03	0.9
Round 4	Player 12	Red/Yellow	<0.1	6.8	2.13	1.09	10.02	1.0
			Overall Dealer Average					**3.6**
			Overall Player Average					**3.1**

Notes:

(a) - Based on the total wipe result from 10 fingertips divided by 10.

(b) - There was one detect near the detection limit followed by two non-detect results.

(c) - This result appears to be anomalous.

ND - Non-detect.

Table 2. Chip results

Chip Color	Content (ppm)	Wipe 1 (µg)	Wipe 2 (µg)	Wipe 3 (µg)	Wipe Total (µg)
Blank Chip	<2.50	<0.1	<0.1	<0.1	ND
Gold	414,000	211	61.4	22.5	294.9
Red	13,500	3.43	0.424	0.281	4.135
White	56,400	17	4.04	1.74	22.78
Yellow	23,000	10	1.04	0.62	11.425

Notes:
ND - Non-detect

Table 3. Air sampling results

Sample	Sample Location	Lead (µg)	Air Volume (liters)	Lead concentration (µg/m^3)
D-2	Breathing zone, right side of dealer	<0.03	1037	<0.03
D-3	Hallway, outside sample room	<0.03	1081	<0.03
D-4	Ambient, outside of building	<0.03	1085	<0.03
D-5	Breathing zone of players	<0.03	1058	<0.03
	Blank	<0.03	NA	NA

Notes:
NA - not applicable.

Table 4. Calculation of number of contacts

Round	Subject	Average per Fingertip (µg)	Number of Contacts to Reach 130 µg/day (30 µg/dL in blood)	Number of Contacts to Reach 25 µg/day (10 µg/dL in blood)
Round 1	Dealer	ND	NA	NA
Round 1	Player 1	ND	NA	NA
Round 1	Player 2	ND	NA	NA
Round 1	Player 3	ND	NA	NA
Round 2	Dealer	5.3	24	5
Round 2	Player 4	14.5	9	2
Round 2	Player 5	1.3	100	19
Round 2	Player 6	6.7	19	4
Round 3	Dealer	4.4	29	6
Round 3a	Player 7	6.4	20	4
Round 3a	Player 8	0.2	531	102
Round 3a	Player 9	1.3	103	20
Round 3b	Player 7	1.7	76	15
Round 3b	Player 8	1.4	91	18
Round 3b	Player 9	0.3	426	82
Round 4	Dealer	1.2	108	21
Round 4	Player 10	0.8	155	30
Round 4	Player 11	0.9	144	28
Round 4	Player 12	1.0	130	25
Overall Dealer Average			54	10
Overall Player Average			150	29

Attachment A

Protocol for Chip-Handling Study

Protocol for Chip-Handling Study

Objective

The objective of this study is to determine the potential for transfer of lead to the fingertips while handling gaming chips during playing of Blackjack, and to determine lead concentrations in air during the game.

Approach

A volunteer Dealer from GPI, along with volunteer Players, will play Blackjack using GPI gaming chips. After chip handling, a Sampler will take wipe samples of the Dealer's fingertips to remove lead that is transferred to the fingertips. Players will also have their fingertips wiped. All wipes will be submitted to a laboratory for lead analysis. The surface area of the Dealer and each Player's fingertips will be measured. We have assumed that the Dealer and Players handle chips similarly with both hands. Therefore, samples will be collected from fingertips of both hands and thumbs. A total of four one-hour sessions will be conducted using gaming chips supplied by GPI. The first session will be conducting using mold-injected chips[4] supplied by GPI to serve as a control. The subsequent three sessions will be played with Paulson chips that contain some amount of lead. Gaming chips will be analyzed for lead content using a portable x-ray fluorescence (XRF) unit prior to study. Additionally, some of the chips will be wiped prior to the study, to determine the amount of lead that can potentially be wiped off. One sample of each different gaming chip will also be sampled for total lead content.

Study Population

Exponent proposes that a pilot study be conducted at an Exponent facility using the GPI-supplied dealer and volunteer players recruited from Exponent. The purpose of the pilot study is to evaluate the sampling methodologies and procedures, and to provide preliminary data to assess the potential for lead exposure among card dealers and players. All Exponent volunteers will be instructed on the protocol and will sign a consent agreement prior to participating in the study. For this testing protocol, volunteers will be monitored and informed that at no time will they be allowed to place their hands near their mouth or face. The volunteers will wash their hands immediately after having hands wiped; therefore, at no time will the volunteers be directly exposed to lead. An internal Exponent review board has approved the use of human subjects in this study.

Sampling Methodology

The Dealer and Players will remove any hand jewelry and wash (using laboratory detergent and laboratory-grade deionized [DI] water) and dry (using KimWipes®) their hands. A background

[4] These chips contain no added lead.

wipe sample of the entire hands (front and back) will be obtained from the Dealer and each Player, to ensure that there is no lead on the hands prior to handling of the chips. The Dealer and Players will then repeat the DI rinsing and drying process and will exercise for two minutes to replace moisture on the hands while taking care not to touch any surfaces.

In addition to background hand-wipe samples, method blanks, and wipes of gloves worn by the Sampler will be obtained. All wipe samples will be placed directly into digestion tubes supplied by the laboratory and placed in pre-labeled resealable plastic bags and submitted under standard chain-of-custody procedures to an accredited laboratory for preparation and analysis.

The Dealer will then be taken to a room in which a gaming chips rack will be placed on a gaming table, and will be asked to handle the chips as they normally would during the course of dealing actual card games. Three Players will be located at the table. The Dealer will deal and oversee a game of Blackjack for 1 hour.

In the first 1-hour session, the Dealer and Players will play Blackjack with mold-injected chips to which no lead has been added. For the second, third, and fourth sessions, the Dealer and Players will play Blackjack with Paulson chips that contain some amount of lead. In between each session, fingertips will be wiped in accordance with the wiping procedure below.

Based on XRF measurements, Exponent will segregate the colors of chips into low, medium, and high lead content. In the second session, the dealer will provide players with only one color of chip per player (i.e., low, medium or high), and the players will only use those chips throughout the entire one-hour session. The dealer will handle all three colors of chips. The third session is similar to the second, except the session was split into two half-hour sessions in which each players used a different set of chips than they used in the first half of the session. For the fourth session, all players and the dealer will use a combination of medium and low content chips.

Lead will be extracted from the samples according to EPA Method 3050 Modified (acid digestion), with subsequent lead content analysis by EPA Method 6020 using inductively coupled plasma/mass spectrometry.

Materials

- Laboratory detergent (Alconox)
- Deionized water
- Water bottles
- Kimwipes®
- Powder-free latex gloves (or suitable alternative if volunteers have latex allergies)
- Resealable plastic bags
- Digestion tubes (supplied by laboratory)
- Wipes (Ghost Wipes)
- Labels
- Marking pen

- Graph paper
- Variety of Paulson gaming chips supplied by GPI
- Card shoe
- 6–8 sets of playing cards
- Gaming table
- Mold-injected non-lead chips supplied by GPI
- 0.8-μg cellulose ester membrane filter
- Air-sampling pumps
- Air-sampling tubing
- Air pump calibrator.

Protocol – Fingertip Wipes

The following protocol is to be conducted by the Sampler for the Dealer and each Player.

Step 1: The Sampler rolls up his/her sleeves and removes any hand jewelry (i.e., rings, watches, bracelets etc.), washes hands with laboratory detergent and water, rinses with DI water, dries with laboratory Kimwipe® tissues, and puts on a new pair of latex gloves (or alternative gloves, as needed). The Sampler removes a new wipe from the container and wipes the palm and backside of each of the latex gloves. The wipe is placed in a laboratory-supplied digestion tube and then in a re-sealable pre-labeled plastic bag (glove control).

Step 2: The Sampler removes a new wipe from the container and places it in a digestion tube and then into a pre-labeled resealable plastic bag (wipe control).

Step 3: The Dealer or Player rolls up his/her sleeves, removes any hand jewelry, washes his hands with laboratory detergent and water, rinses with deionized water, and dries with laboratory Kimwipe® tissues. The sampler removes a new wipe from the container and wipes the volunteer's hands to obtain a background sample of the volunteer's hands. Each wipe is placed in a digestion tube and then in a pre-labeled resealable plastic bag (fingertip and hand controls). The volunteer repeats the DI rinsing and drying process.

Step 4: The Sampler instructs the Dealer and Players to exercise in place for two minutes to build up natural moisture on the hands. This exercise could involve marching in place or doing jumping jacks. The Dealer and Players will be instructed to not touch any surface with their hands while exercising.

Step 5: The Sampler places the rack of chips on a game table. Seated at the table are three Players. The Players and Dealer will be instructed to play a game of Blackjack for an approximate 1-hour period using the chips. The Sampler records observations such as number of times contacting chips and other surfaces.

Step 6: Sampler removes and disposes of his/her gloves, puts on a new pair of latex gloves, removes a new wipe from the container, and wipes the fingertips and thumbs of both hands of the Dealer and each Player from the last joint to the tip (distal phalange). The wipe is placed in a digestion tube and then a pre-labeled resealable plastic bag. The Sampler repeats the wiping of fingertips two additional times, for a total of three fingertip wipes, and places each of the three wipes in separate digestion tubes and then into pre-labeled resealable bags.

Step 7: After the Dealer and Players wash their hands, the size of the hand and fingertips is measured and recorded by photocopying the outline of the hand onto a sheet of graph paper.

Step 8: Steps 1 through 6 are repeated for three additional 1-hour sessions; however only two glove control and two wipe control samples will only be collected during the sampling day.

Product Wipes and Content Samples

The Sampler removes and disposes of his/her gloves, puts on a new pair of latex gloves, removes a new wipe from the container, and wipes the entire surface of a gaming chip 10 times. The wipe is placed in a digestion tube and then in a pre-labeled resealable plastic bag. The sampler repeats this process twice, for a total of three 10-stroke wipes per gaming chip. This step is repeated for a total of four gaming chips and one mold-injected chip. Five chips (one of each color) will be submitted for analysis for total lead content.

Air Samples

Air samples will be collected for the duration of all four Blackjack sessions to represent an 8-hour time-weighted average exposure. Air samples will be collected using a two-piece filter holder cassette with a 0.8-μg cellulose ester membrane filter and sampling pumps. Two samplers will be placed on each side of the dealer at the dealer's breathing-zone height. An additional sampler will be placed near the players, at their breathing-zone height. Samples will be collected in accordance with NIOSH Method 7300 and analyzed by graphite furnace at an AIHA-accredited laboratory. Air-sampling pumps will be calibrated prior to and after sampling. One each of an outdoor and indoor background air sample will also be collected. A Certified Industrial Hygienist will conduct the air sampling.

Number of Samples

- Dealer – samples to be analyzed
  - 12 fingertip wipes (3 wipes per session × 4 sessions)
  - 4 background hand controls (1 wipe × 4 sessions)

- Player – samples to be collected but held prior to analysis
  - 45 fingertip wipes (3 wipes per session × 5 sessions × 3 players per session)
  - 15 background hand controls (1 wipe per player × 3 players/session × 5 sessions)
- 2 glove controls
- 2 study blanks
- 3 unopened wipe controls
- 15 chip wipes (3 wipes of 4 different-colored product chips + 1 mold-injected non-lead chip)
- 2 laboratory quality assurance/quality control wipes (spikes prepared by laboratory)
- 5 content samples (1 sample for 5 different chips)
- 5 air samples.

Wipe and Content Sample Preparation/Analysis

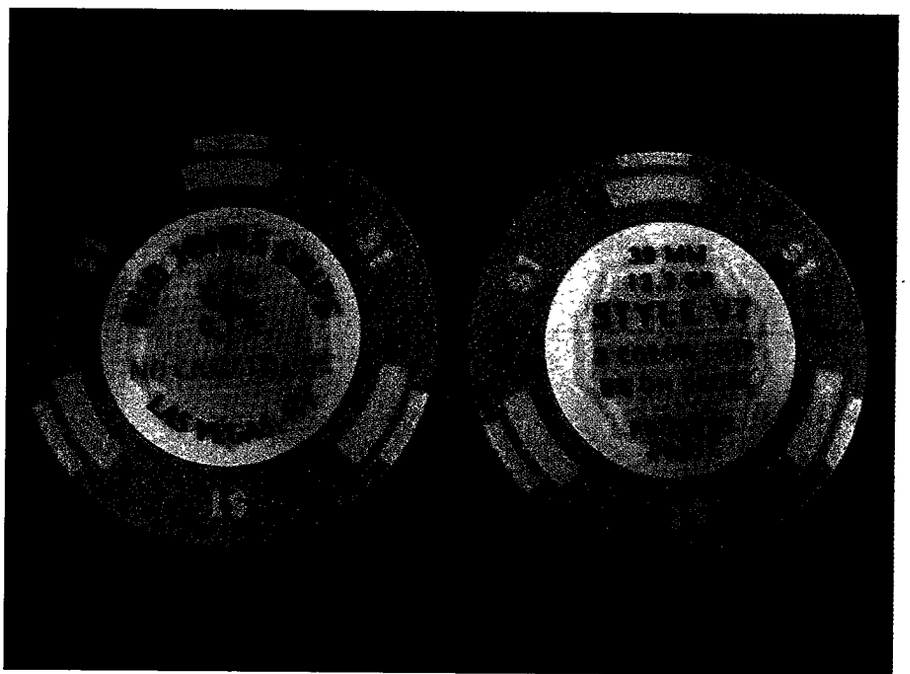
All wipe and content samples will be submitted under standard chain-of-custody procedures to K-prime Inc., located in Santa Rosa, California, which is an accredited analytical laboratory. Resealable plastic sample bags will be pre-labeled with the sample identifier, sample type, and sampling date. Samples will be prepared by the analytical laboratory according to EPA Method 3050 or an equivalent method. Samples will be analyzed for total lead by EPA Method 6020 (inductively coupled plasma/mass spectrometry). The target detection limit for wipe samples will be 0.1 μg/sample and will not exceed 0.25 μg/sample. The target detection limit for content samples will be 5 parts per million (ppm).

Air Sample Preparation/Analysis

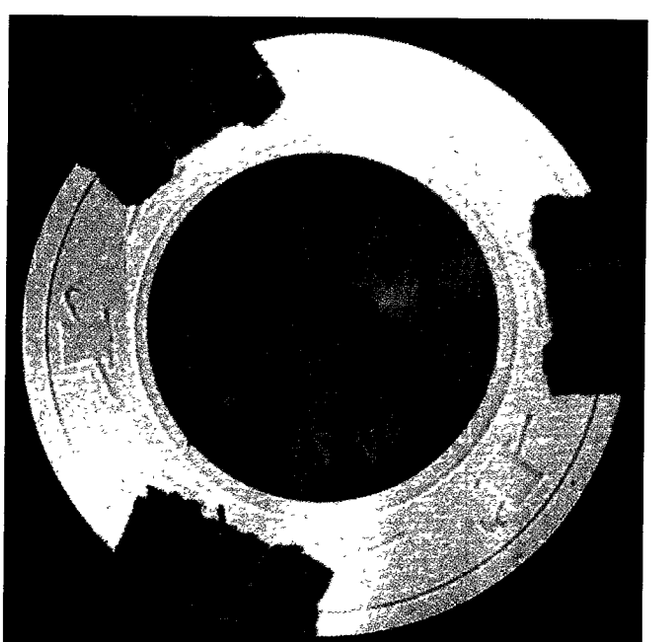
All air-sampling cassettes will be submitted under standard chain-of-custody procedures to EMS Laboratories, located in Pasadena, California, which is an AIHA-accredited analytical laboratory. Resealable plastic sample bags will be pre-labeled with the sample identifier, sample type, and sampling date. Samples will be prepared by the analytical laboratory according to NIOSH Method 7400 and analyzed for total lead using graphite furnace. The target detection limit for air samples will be 0.03 μg per filter.

Attachment B

Photos of Chips Used



Bud Jones Chips — plastic chip with no added lead



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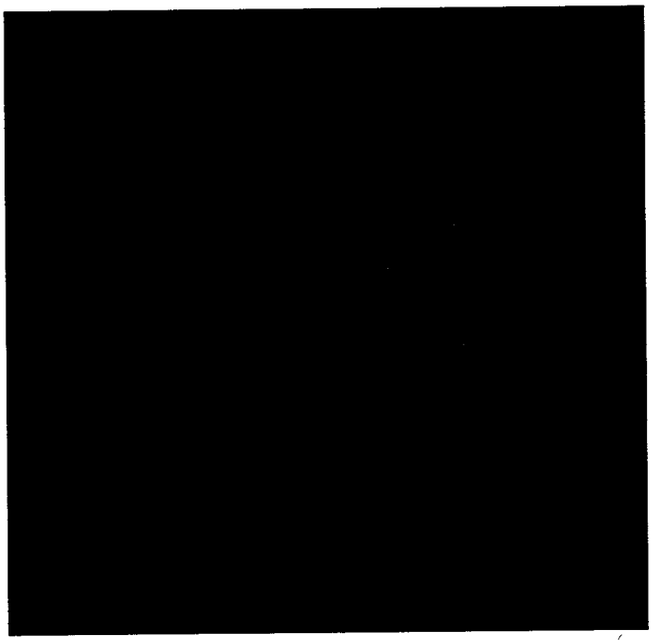
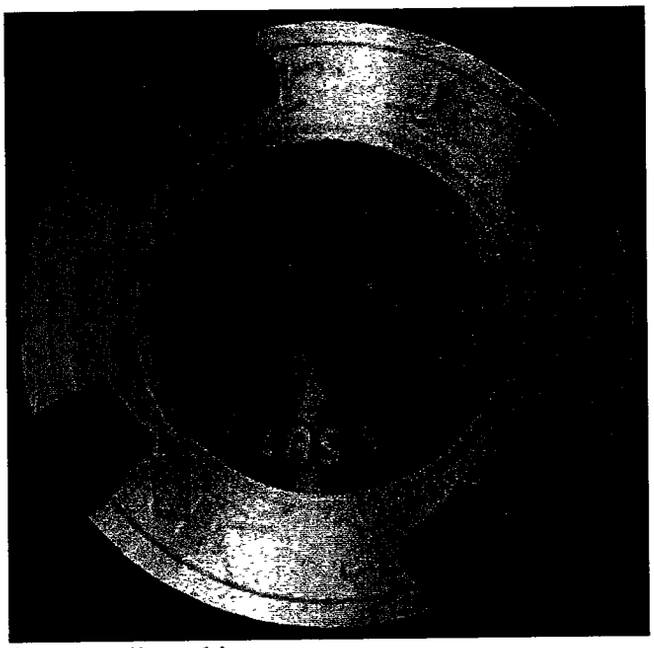
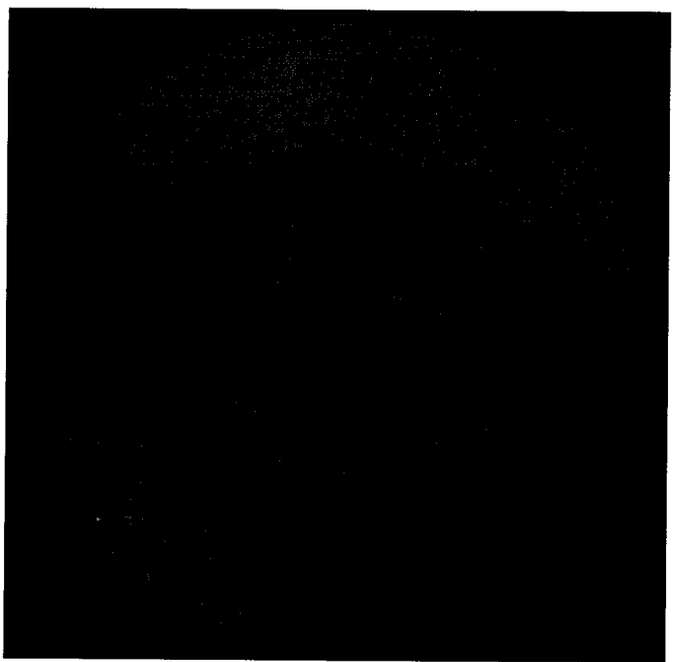


$5 Red chip



$1000 Yellow chip



$5000 Gold chip

Attachment C

Laboratory Data Reports

CONFIDENTIAL: ATTORNEY WORK PRODUCT

K PRIME, Inc.

CONSULTING ANALYTICAL CHEMISTS

3621 Westwind Blvd.
Santa Rosa CA 95403
Phone: 707 527 7574
FAX: 707 527 7879

TRANSMITTAL

DATE: 11/21/07

TO: MR. JOHN ALLEN
MS. EILEEN NOTTOLI
ALLEN MATKINS ET AL LLP
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enottoli@allenmatkins.com

ACCT: 9952
PROJ: GPI-CHIP ANALYSIS

FROM: Richard A. Kagel, Ph.D.
Laboratory Director RAK/mcw 11/21/07

SUBJECT: LABORATORY RESULTS FOR YOUR PROJECT GPI-CHIP ANALYSIS

Enclosed please find K Prime's laboratory reports for the following samples:

SAMPLE ID	TYPE	DATE	TIME	KPI LAB #
R1-D-H	WIPE	11/20/07	9:45	65069
R1-P1-H	WIPE	11/20/07	9:45	65070
R1-P2-H	WIPE	11/20/07	9:45	65071
R1-P3-H	WIPE	11/20/07	9:45	65072
R1-D-WA	WIPE	11/20/07	11:00	65073
R1-D-WB	WIPE	11/20/07	11.00	65074
R1-D-WC	WIPE	11/20/07	11:00	65075
R1-P1-WA	WIPE	11/20/07	11:00	65076
R1-P1-WB	WIPE	11/20/07	11:00	65077
R1-P1-WC	WIPE	11/20/07	11:00	65078
R1-P2-WA	WIPE	11/20/07	11:00	65079
R1-P2-WB	WIPE	11/20/07	11:00	65080
R1-P2-WC	WIPE	11/20/07	11:00	65081
R1-P3-WA	WIPE	11/20/07	11:00	65082
R1-P3-WB	WIPE	11/20/07	11.00	65083
R1-P3-WC	WIPE	11/20/07	11:00	65084
R2-D-H	WIPE	11/20/07	11:15	65085
R2-P4-H	WIPE	11/20/07	11:15	65086
R2-P5-H	WIPE	11/20/07	11:15	65087
R2-P6-H	WIPE	11/20/07	11:15	65088
R2-D-WA	WIPE	11/20/07	12:30	65089

R2-D-WB	WIPE	11/20/07	12:30	65090
R2-D-WC	WIPE	11/20/07	12:30	65091
R2-P4-WA	WIPE	11/20/07	12:30	65092
R2-P4-WB	WIPE	11/20/07	12:30	65093
R2-P4-WC	WIPE	11/20/07	12:30	65094
R2-P5-WA	WIPE	11/20/07	12:30	65095
R2-P5-WB	WIPE	11/20/07	12:30	65096
R2-P5-WC	WIPE	11/20/07	12.30	65097
R2-P6-WA	WIPE	11/20/07	12:30	65098
R2-P6-WB	WIPE	11/20/07	12:30	65099
R2-P6-WC	WIPE	11/20/07	12:30	65100
R3A-D-H	WIPE	11/20/07	1:15	65101
R3A-P7-H	WIPE	11/20/07	1:15	65102
R3A-P8-H	WIPE	11/20/07	1:15	65103
R3A-P9-H	WIPE	11/20/07	1:15	65104
R3A-P7-WA	WIPE	11/20/07	2:00	65105
R3A-P7-WB	WIPE	11/20/07	2:00	65106
R3A-P7-WC	WIPE	11/20/07	2.00	65107
R3A-P8-WA	WIPE	11/20/07	2:00	65108
R3A-P8-WB	WIPE	11/20/07	2:00	65109
R3A-P8-WC	WIPE	11/20/07	2.00	65110
R3A-P9-WA	WIPE	11/20/07	2:00	65111
R3A-P9-WB	WIPE	11/20/07	2:00	65112
R3A-P9-WC	WIPE	11/20/07	2:00	65113
R3B-P7-H	WIPE	11/20/07	2:15	65114
R3B-P8-H	WIPE	11/20/07	2:15	65115
R3B-P9-H	WIPE	11/20/07	2:15	65116
R3B-D-WA	WIPE	11/20/07	3.00	65117
R3B-D-WB	WIPE	11/20/07	3:00	65118
R3B-D-WC	WIPE	11/20/07	3:00	65119
R3B-P7-WA	WIPE	11/20/07	3:00	65120
R3B-P7-WB	WIPE	11/20/07	3:00	65121
R3B-P7-WC	WIPE	11/20/07	3:00	65122
R3B-P8-WA	WIPE	11/20/07	3:00	65123
R3B-P8-WB	WIPE	11/20/07	3:00	65124
R3B-P8-WC	WIPE	11/20/07	3:00	65125
R3B-P9-WA	WIPE	11/20/07	3:00	65126
R3B-P9-WB	WIPE	11/20/07	3:00	65127
R3B-P9-WC	WIPE	11/20/07	3:00	65128
R4-D-H	WIPE	11/20/07	2:45	65129
R4-P10-H	WIPE	11/20/07	2:45	65130
R4-P11-H	WIPE	11/20/07	2:45	65131
R4-P12-H	WIPE	11/20/07	2:45	65132
R4-D-WA	WIPE	11/20/07	4:00	65133
R4-D-WB	WIPE	11/20/07	4:00	65134
R4-D-WC	WIPE	11/20/07	4:00	65135
R4-P10-WA	WIPE	11/20/07	4:00	65136
R4-P10-WB	WIPE	11/20/07	4:00	65137
R4-P10-WC	WIPE	11/20/07	4:00	65138
R4-P11-WA	WIPE	11/20/07	4:00	65139
R4-P11-WB	WIPE	11/20/07	4:00	65140
R4-P11-WC	WIPE	11/20/07	4:00	65141
R4-P12-WA	WIPE	11/20/07	4:00	65142

R4-P12-WB	WIPE	11/20/07	4.00	65143
R4-P12-WC	WIPE	11/20/07	4:00	65144
GB-1	WIPE	11/20/07	9·45	65145
GB-2	WIPE	11/20/07	4:00	65146
BW-1	WIPE	11/20/07	9:45	65147
BW-2	WIPE	11/20/07	4:00	65148
UW-1	WIPE	11/20/07	9:45	65149
UW-2	WIPE	11/20/07	9.45	65150
UW-3	WIPE	11/20/07	9·45	65151

The above listed sample group was received on 11/20/07 and tested as requested on the chain of custody document.

Please call me if you have any questions or need further information.
Thank you for this opportunity to be of service.

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: WIPE
UNITS: ug

SAMPLE ID ID	LAB ID #	DATE SAMPLED	BATCH #	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
R1-D-H	65069	11/20/07	112007WP01	Nov 20 2007	0.100	ND
R1-P1-H	65070	11/20/07	112007WP01	Nov 20 2007	0.100	ND
R1-P2-H	65071	11/20/07	112007WP01	Nov 20 2007	0.100	ND
R1-P3-H	65072	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-D-WA	65073	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-D-WB	65074	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-D-WC	65075	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P1-WA	65076	11/20/07	112007WP01	Nov 21 2007	0.100	0.215
R1-P1-WB	65077	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P1-WC	65078	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P2-WA	65079	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P2-WB	65080	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P2-WC	65081	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P3-WA	65082	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P3-WB	65083	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R1-P3-WC	65084	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R2-D-H	65085	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R2-P4-H	65086	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R2-P5-H	65087	11/20/07	112007WP01	Nov 21 2007	0.100	ND
R2-P6-H	65088	11/20/07	112007WP01	Nov 21 2007	0.100	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE

APPROVED BY: ch

DATE: 11/21/07

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: WIPE
UNITS: ug

SAMPLE ID ID	LAB ID #	DATE SAMPLED	BATCH #	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
R2-D-WA	65089	11/20/07	112007WP02	Nov 21 2007	0.100	40.9
R2-D-WB	65090	11/20/07	112007WP02	Nov 21 2007	0.100	7.76
R2-D-WC	65091	11/20/07	112007WP02	Nov 21 2007	0.100	4.44
R2-P4-WA	65092	11/20/07	112007WP02	Nov 21 2007	0.100	106
R2-P4-WB	65093	11/20/07	112007WP02	Nov 21 2007	0.100	28.0
R2-P4-WC	65094	11/20/07	112007WP02	Nov 21 2007	0.100	11.2
R2-P5-WA	65095	11/20/07	112007WP02	Nov 21 2007	0.100	10.5
R2-P5-WB	65096	11/20/07	112007WP02	Nov 21 2007	0.100	1.81
R2-P5-WC	65097	11/20/07	112007WP02	Nov 21 2007	0.100	0.682
R2-P6-WA	65098	11/20/07	112007WP02	Nov 21 2007	0.100	50.2
R2-P6-WB	65099	11/20/07	112007WP02	Nov 21 2007	0.100	10.8
R2-P6-WC	65100	11/20/07	112007WP02	Nov 21 2007	0.100	6.14
R3A-D-H	65101	11/20/07	112007WP02	Nov 21 2007	0.100	ND
R3A-P7-H	65102	11/20/07	112007WP02	Nov 21 2007	0.100	ND
R3A-P8-H	65103	11/20/07	112007WP02	Nov 21 2007	0.100	ND
R3A-P9-H	65104	11/20/07	112007WP02	Nov 21 2007	0.100	ND
R3A-P7-WA	65105	11/20/07	112007WP02	Nov 21 2007	0.100	56.1
R3A-P7-WB	65106	11/20/07	112007WP02	Nov 21 2007	0.100	5.12
R3A-P7-WC	65107	11/20/07	112007WP02	Nov 21 2007	0.100	2.99
R3A-P8-WA	65108	11/20/07	112007WP02	Nov 21 2007	0.100	1.88

NOTES:
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NA - NOT AVAILABLE OR APPLICABLE

APPROVED BY: ch

DATE: 11/21/07

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: WIPE
UNITS: ug

SAMPLE ID ID	LAB ID #	DATE SAMPLED	BATCH #	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
R3A-P8-WB	65109	11/20/07	112007WP03	Nov 21 2007	0.100	0.387
R3A-P8-WC	65110	11/20/07	112007WP03	Nov 21 2007	0.100	0.183
R3A-P9-WA	65111	11/20/07	112007WP03	Nov 21 2007	0.100	9.74
R3A-P9-WB	65112	11/20/07	112007WP03	Nov 21 2007	0.100	2.06
R3A-P9-WC	65113	11/20/07	112007WP03	Nov 21 2007	0.100	0.882
R3B-P7-H	65114	11/20/07	112007WP03	Nov 21 2007	0.100	ND
R3B-P8-H	65115	11/20/07	112007WP03	Nov 21 2007	0.100	ND
R3B-P9-H	65116	11/20/07	112007WP03	Nov 21 2007	0.100	5.90
R3B-D-WA	65117	11/20/07	112007WP03	Nov 21 2007	0.100	33.8
R3B-D-WB	65118	11/20/07	112007WP03	Nov 21 2007	0.100	7.81
R3B-D-WC	65119	11/20/07	112007WP03	Nov 21 2007	0.100	2.78
R3B-P7-WA	65120	11/20/07	112007WP03	Nov 21 2007	0.100	12.7
R3B-P7-WB	65121	11/20/07	112007WP03	Nov 21 2007	0.100	2.84
R3B-P7-WC	65122	11/20/07	112007WP03	Nov 21 2007	0.100	1.64
R3B-P8-WA	65123	11/20/07	112007WP03	Nov 21 2007	0.100	9.59
R3B-P8-WB	65124	11/20/07	112007WP03	Nov 21 2007	0.100	3.30
R3B-P8-WC	65125	11/20/07	112007WP03	Nov 21 2007	0.100	1.32
R3B-P9-WA	65126	11/20/07	112007WP03	Nov 21 2007	0.100	1.91
R3B-P9-WB	65127	11/20/07	112007WP03	Nov 21 2007	0.100	0.874
R3B-P9-WC	65128	11/20/07	112007WP03	Nov 21 2007	0.100	0.270

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE

APPROVED BY: ch

DATE: 11/21/07

CONFIDENTIAL: ATTORNEY WORK PRODUCT

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: WIPE
UNITS: ug

SAMPLE ID ID	LAB ID #	DATE SAMPLED	BATCH #	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
R4-D-H	65129	11/20/07	112007WP04	Nov 21 2007	0.100	ND
R4-P10-H	65130	11/20/07	112007WP04	Nov 21 2007	0.100	ND
R4-P11-H	65131	11/20/07	112007WP04	Nov 21 2007	0.100	ND
R4-P12-H	65132	11/20/07	112007WP04	Nov 21 2007	0.100	ND
R4-D-WA	65133	11/20/07	112007WP04	Nov 21 2007	0.100	9.32
R4-D-WB	65134	11/20/07	112007WP04	Nov 21 2007	0.100	1.34
R4-D-WC	65135	11/20/07	112007WP04	Nov 21 2007	0.100	1.33
R4-P10-WA	65136	11/20/07	112007WP04	Nov 21 2007	0.100	6.23
R4-P10-WB	65137	11/20/07	112007WP04	Nov 21 2007	0.100	1.41
R4-P10-WC	65138	11/20/07	112007WP04	Nov 21 2007	0.100	0.773
R4-P11-WA	65139	11/20/07	112007WP04	Nov 21 2007	0.100	6.53
R4-P11-WB	65140	11/20/07	112007WP04	Nov 21 2007	0.100	1.90
R4-P11-WC	65141	11/20/07	112007WP04	Nov 21 2007	0.100	0.600
R4-P12-WA	65142	11/20/07	112007WP04	Nov 21 2007	0.100	6.80
R4-P12-WB	65143	11/20/07	112007WP04	Nov 21 2007	0.100	2.13
R4-P12-WC	65144	11/20/07	112007WP04	Nov 21 2007	0.100	1.09
GB-1	65145	11/20/07	112007WP04	Nov 21 2007	0.100	ND
GB-2	65146	11/20/07	112007WP04	Nov 21 2007	0.100	ND
BW-1	65147	11/20/07	112007WP04	Nov 21 2007	0.100	ND
BW-2	65148	11/20/07	112007WP04	Nov 21 2007	0.100	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE

APPROVED BY: ch

DATE: 11/21/07

CONFIDENTIAL: ATTORNEY WORK PRODUCT

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: WIPE
UNITS: ug

SAMPLE ID ID	LAB ID #	DATE SAMPLED	BATCH #	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
UW-1	65149	11/20/07	112007WP05	Nov 21 2007	0.100	0.238
UW-2	65150	11/20/07	112007WP05	Nov 21 2007	0.100	0.249
UW-3	65151	11/20/07	112007WP05	Nov 21 2007	0.100	0.244

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE
RESULTS NOT BLANK CORRECTED

APPROVED BY: dw

DATE: 11/21/07

K PRIME, INC.
LABORATORY BATCH QC REPORT

SAMPLE ID: L11200701-WIPE
DUPLICATE ID: D11200701-WIPE
METHOD BLANK ID: B11200701-WIPE
BATCH ID: 112007WP01
METHOD: METALS
SAMPLE TYPE: WIPE
REFERENCE: EPA 3050/6020
UNITS: µg/wipe

COMPOUND	MB	SA	SR	SP	SPD	SP %R	RPD %
LEAD	ND (<0.1)	4.00	0.0	3.94	3.90	98	1.1

NOTES:

ND:	NOT DETECTED
MB:	METHOD BLANK
SA:	SPIKE ADDED
SR:	SAMPLE RESULT
SP:	SPIKE RESULT
SPD:	SPIKE DUPLICATE RESULT
SP(%R):	SPIKE % RECOVERY
RPD:	RELATIVE PERCENT DIFFERENCE

K PRIME, INC.

LABORATORY BATCH QC REPORT

SAMPLE ID: L11200702-WIPE
DUPLICATE ID: D11200702-WIPE
METHOD BLANK ID: B11200702-WIPE
BATCH ID: 112007WP02
METHOD: METALS
SAMPLE TYPE: WIPE
REFERENCE: EPA 3050/6020
UNITS: µg/wipe

COMPOUND	MB	SA	SR	SP	SPD	SP %R	RPD %
LEAD	ND (<0.1)	4.00	0.0	3.83	3.84	96	0.3

NOTES:

ND:	NOT DETECTED
MB:	METHOD BLANK
SA:	SPIKE ADDED
SR:	SAMPLE RESULT
SP:	SPIKE RESULT
SPD:	SPIKE DUPLICATE RESULT
SP(%R):	SPIKE % RECOVERY
RPD:	RELATIVE PERCENT DIFFERENCE

K PRIME, INC.
LABORATORY BATCH QC REPORT

SAMPLE ID: L11200703-WIPE
DUPLICATE ID: D11200703-WIPE
METHOD BLANK ID: B11200703-WIPE
BATCH ID: 112007WP03
METHOD: METALS
SAMPLE TYPE: WIPE
REFERENCE: EPA 3050/6020
UNITS: µg/wipe

COMPOUND	MB	SA	SR	SP	SPD	SP %R	RPD %
LEAD	ND (<0.1)	4.00	0.0	4.11	4.16	103	1.3

NOTES:

ND:	NOT DETECTED
MB:	METHOD BLANK
SA:	SPIKE ADDED
SR:	SAMPLE RESULT
SP:	SPIKE RESULT
SPD:	SPIKE DUPLICATE RESULT
SP(%R):	SPIKE % RECOVERY
RPD:	RELATIVE PERCENT DIFFERENCE

K PRIME, INC.

LABORATORY BATCH QC REPORT

SAMPLE ID: L11200704-WIPE
DUPLICATE ID: D11200704-WIPE
METHOD BLANK ID: B11200704-WIPE
BATCH ID: 112007WP04
METHOD: METALS
SAMPLE TYPE: WIPE
REFERENCE: EPA 3050/6020
UNITS: µg/wipe

COMPOUND	MB	SA	SR	SP	SPD	SP %R	RPD %
LEAD	ND (<0.1)	4.00	0.0	4.09	4.27	102	4.4

NOTES:

ND:	NOT DETECTED
MB:	METHOD BLANK
SA:	SPIKE ADDED
SR:	SAMPLE RESULT
SP:	SPIKE RESULT
SPD:	SPIKE DUPLICATE RESULT
SP(%R):	SPIKE % RECOVERY
RPD:	RELATIVE PERCENT DIFFERENCE

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY** Project: Chip Analysis Telephone No.: (510)268-5007 (510)268-5099	Page 1 of 7 Method of Shipment: Courier Special Detection Limit/Reporting

Sample I.D.	Lab Sample No	No of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)
R1-D-H	65069					x			11/20/2007	9:45	x
R1-P1-H	65070					x			11/20/2007	9:45	x
R1-P2-H	65071					x			11/20/2007	9:45	x
R1-P3-H	65072					x			11/20/2007	9:45	x
R1-D-Wa	65073					x			11/20/2007	11:00	x
R1-D-Wb	65074					x			11/20/2007		x
R1-D-Wc	65075					x			11/20/2007		x
R1-P1-Wa	65076					x			11/20/2007		x
R1-P1-Wb	65077					x			11/20/2007		x
R1-P1-Wc	65078					x			11/20/2007		x
R1-P2-Wa	65079					x			11/20/2007		x
R1-P2-Wb	65080					x			11/20/2007		x
R1-P2-Wc	65081					x			11/20/2007		x
R1-P3-Wa	65082					x			11/20/2007		x
R1-P3-Wb	65083					x			11/20/2007		x
R1-P3-Wc	65084					x			11/20/2007	"	x

Special QA/QC

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice

Relinq by sampler (Sign & Print Name)	Date / Time	Received by (Sign & Print Name)	Lab Work No.
Emily Goswami	11/20/07 5:00	(VTC) 11/20/07 5:50	
Relinquished by (VTC)	Date / Time 11/20/07 20:23	Received by (KT) 20:25	
Relinquished by	Date / Time	Received by laboratory / Time	

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager Renee Kalmes, CIH	**CHAIN of CUSTODY** Project Chip Analysis Telephone No. (510)268-5007 (510)268-5099	Page 2 of 7 Method of Shipment Courier Special Detection Limit/Reporting

Sample I.D.	Lab Sample No	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)
R2-D-H	65085					x			11/20/2007	11:15	x
R2-P4-H	65086					x			11/20/2007		x
R2-P5-H	65087					x			11/20/2007		x
R2-P6-H	65088					x			11/20/2007	"	x
R2-D-Wa	65089					x			11/20/2007	12:30	x
R2-D-Wb	65090					x			11/20/2007		x
R2-D-Wc	65091					x			11/20/2007		x
R2-P4-Wa	65092					x			11/20/2007		x
R2-P4-Wb	65093					x			11/20/2007		x
R2-P4-Wc	65094					x			11/20/2007		x
R2-P5-Wa	65095					x			11/20/2007		x
R2-P5-Wb	65096					x			11/20/2007		x
R2-P5-Wc	65097					x			11/20/2007		x
R2-P6-Wa	65098					x			11/20/2007		x
R2-P6-Wb	65099					x			11/20/2007		x
R2-P6-Wc	65100					x			11/20/2007	"	x

Special QA/QC

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice

	Date	Time		Date	Time	Lab Work No.
Relinq. by sampler (Sign & Print Name) Emily Goswami	11/20/07	5:00	Received by (Sign & Print Name) Enod (VTC)	11/20/07	5:50	
Relinquished by Enod (VTC)	11/20/07	20:25	Received by A Barba		20:25	
Relinquished by	Date	Time	Received by laboratory		Time	

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY** Project: Chip Analysis Telephone No: (510)268-5007 (510)268-5099	Page 3 of 7 Method of Shipment: Courier Special Detection Limit/Reporting

Sample I.D.	Lab Sample No	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)
R3a-D-H	65101					x			11/20/2007	1:15	x
R3a-P7-H	65102					x			11/20/2007		x
R3a-P8-H	65103					x			11/20/2007		x
R3a-P9-H	65104					x			11/20/2007		x
~~R3a-D-Wa~~						~~x~~			~~11/20/2007~~		~~x~~
~~R3a-D-Wb~~						x			11/20/2007		x
~~R3a-D-Wc~~						~~x~~			~~11/20/2007~~		~~x~~
R3a-P7-Wa	65105					x			11/20/2007	2:00	x
R3a-P7-Wb	65106					x			11/20/2007		x
R3a-P7-Wc	65107					x			11/20/2007		x
R3a-P8-Wa	65108					x			11/20/2007		x
R3a-P8-Wb	65109					x			11/20/2007		x
R3a-P8-Wc	65110					x			11/20/2007		x
R3a-P9-Wa	65111					x			11/20/2007		x
R3a-P9-Wb	65112					x			11/20/2007		x
R3a-P9-Wc	65113					x			11/20/2007		x

Special QA/QC

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)	Date	Time
Emily Goswami	11/20/07	5:00	Email (VTC)	11/20/07	5:50
Relinquished by: Email (VTC)	Date: 11/20/07	Time: 20:25	Received by		20:25
Relinquished by	Date	Time	Received by laboratory		Time

Lab Work No.

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY**	Page 4 of 7 Method of Shipment: Courier
		Project: Chip Analysis Telephone No.: (510)268-5007 (510)268-5099	Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)	Special QA/QC
[redacted]												
R3b-P7-H	65114					x			11/20/2007	2:15	x	
R3b-P8-H	65115					x			11/20/2007	2:15	x	
R3b-P9-H	65116					x			11/20/2007	2:15	x	
[redacted] R3b-D-Wa	65117					x			[redacted]	3:00	x	
[redacted] R3b-D-Wb	65118					x			[redacted]		x	
[redacted] R3b-DW-c	65119					x			[redacted]		x	
R3b-P7-Wa	65120					x			11/20/2007		x	
R3b-P7-Wb	65121					x			11/20/2007		x	
R3b-P7-Wc	65122					x			11/20/2007		x	
R3b-P8-Wa	65123					x			11/20/2007		x	
R3b-P8-Wb	65124					x			11/20/2007		x	
R3b-P8-Wc	65125					x			11/20/2007		x	
R3b-P9-Wa	65126					x			11/20/2007		x	
R3b-P9-Wb	65127					x			11/20/2007		x	
R3b-P9-Wc	65128					x			11/20/2007		x	

REMARKS

Sample Received Intact: Yes No		Temperature received: Ice	
Relinq. by sampler (Sign & Print Name) Emily Goswami	Date: 11/20/07 Time: 5:00	Received by (Sign & Print Name) Emily (VTC)	Date: 11/20/07 Time: 5:50
Relinquished by Emily (VTC)	Date: 11/20/07 Time: 20:25	Received by [redacted]	Time: 20:25
Relinquished by	Date: Time:	Received by laboratory	Time:

Lab Work No.

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY**	Page 5 of 7 Method of Shipment: Courier
		Project: Chip Analysis Telephone No.: (510)268-5007 (510)268-5099	Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)
R4-D-H	65129					x			11/20/2007	2:45	x
R4-P10-H	65130					x			11/20/2007		x
R4-P11-H	65131					x			11/20/2007		x
R4-P12-H	65132					x			11/20/2007		x
R4-D-Wa	65133					x			11/20/2007	4:00	x
R4-D-Wb	65134					x			11/20/2007		x
R4-D-Wc	65135					x			11/20/2007		x
R4-P10-Wa	65136					x			11/20/2007		x
R4-P10-Wb	65137					x			11/20/2007		x
R4-P10-Wc	65138					x			11/20/2007		x
R4-P11-Wa	65139					x			11/20/2007		x
R4-P11-Wb	65140					x			11/20/2007		x
R4-P11-Wc	65141					x			11/20/2007		x
R4-P12-Wa	65142					x			11/20/2007		x
R4-P12-Wb	65143					x			11/20/2007		x
R4-P12-Wc	65144					x			11/20/2007		x

Special QA/QC

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)
Emily Goswami	11/21/07	5:00	Emil (FTC) 11/20/07 5:50
Relinquished by: Emil (FTC)	Date: 11/21/07	Time: 20:25	Received by
Relinquished by	Date	Time	Received by laboratory

Lab Work No.

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY**	Page 6 of 7 Method of Shipment: Courier
		Project: Chip Analysis Telephone No.: (510)268-5007 (510)268-5099	Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)
GB-1	65145					x			11/20/2007	9:45	x
GB-2	65146					x			11/20/2007	4:00	x
BW-1	65147					x			11/20/2007	9:45	x
BW-2	65148					x			11/20/2007	4:00	x
UW-1	65149					x			11/20/2007	9:45	x
UW-2	65150					x			11/20/2007	9:45	x
UW-3	65151					x			11/20/2007	9:45	x
C1-Wa	65152					x			11/20/2007	3:30	x
C1-Wb	65153					x			11/20/2007		x
C1-Wc	65154					x			11/20/2007		x
C2-Wa	65155					x			11/20/2007		x
C2-Wb	65156					x			11/20/2007		x
C2-Wc	65157					x			11/20/2007		x
C3-Wa	65158					x			11/20/2007		x
C3-Wb	65159					x			11/20/2007		x
C3-Wc	65160					x			11/20/2007	↓	x

Special QA/QC

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)	Lab Work No.
Emily Goswami	11/20/07	5:00	Chad (VTC) 11/20/07	5:30
Relinquished by: Chad (VTC)	Date: 11/20/07	Time: 20:25	Received by:	
Relinquished by	Date	Time	Received by laboratory	Time

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY**	Page 7 of 7 Method of Shipment: Courier
		Project: Chip Analysis Telephone No.: (510)268-5007 (510)268-5099	Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)														
C1	65161		x						11/20/2007	3:30	~~x~~	~~HOLD~~													
C2	65162		x						11/20/2007		x														
C3	65163		x						11/20/2007		x														
C4	65164		x								x														
C5	65165		x								x														
C6	65166		x									~~HOLD~~													
C7	65167		x									~~HOLD~~													
C4-Wa	65168		x			X					x														
C4-Wb	65169		x			X					x														
C4-Wc	65170		x			X					x														
C5-Wa	65171		x			X					x														
C5-Wb	65172		x			X					x														
C5-Wc	65173		x			X					x														
D-1	65174				X						x														

Analyze

Special QA/QC

CHIPTINLAY SEPARATE CAM17

REMARKS: [Changes per Eileen 11/21/07 pm]

Sample Received Intact: Yes No

Temperature received: Ice

Relinq. by sampler (Sign & Print Name) Emily Goswami	Date / Time 11/20/07 5:00	Received by (Sign & Print Name) (VIC) 11/20/07 5:30	Lab Work No.
Relinquished by (VIC)	Date / Time 11/20/07 20:25	Received by 20:26	
Relinquished by	Date / Time	Received by laboratory / Time	

CONFIDENTIAL: ATTORNEY WORK PRODUCT

K PRIME, Inc.

CONSULTING ANALYTICAL CHEMISTS

3621 Westwind Blvd.
Santa Rosa CA 95403
Phone: 707 527 7574
FAX: 707 527 7879

TRANSMITTAL

DATE: 12/04/07

TO: MR. JOHN ALLEN
MS. EILEEN NOTTOLI
ALLEN MATKINS ET AL LLP
3 EMBARCADERO CENTER, 12TH FLOOR
SAN FRANCISCO, CA 94111

Phone: 415-837-1515
Fax: 415-837-1516 213-620-8816
Email: jallen@allenmatkins.com
enottoli@allenmatkins.com

ACCT: 9952
PROJ: GPI-CHIP ANALYSIS

FROM: Richard A. Kagel, Ph.D.
Laboratory Director RAKagel 12/4/07

SUBJECT: LABORATORY RESULTS FOR YOUR PROJECT GPI-CHIP ANALYSIS

Enclosed please find K Prime's laboratory reports for the following samples:

SAMPLE ID	TYPE	DATE	TIME	KPI LAB #
C2	SOLID	11/20/07	3:30	65162
C3	SOLID	11/20/07	3:30	65163
C4	SOLID	11/20/07	3:30	65164
C5	SOLID	11/20/07	3:30	65165

The above listed sample group was received on 11/20/07 and tested as requested on the chain of custody document.

Please call me if you have any questions or need further information.
Thank you for this opportunity to be of service.

CONFIDENTIAL: ATTORNEY WORK PRODUCT

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020A

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: PRODUCT
UNITS: mg/Kg

SAMPLE ID	LAB ID	BATCH #	DATE SAMPLED	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
C2	65162	113007P01	11/20/07	12/03/07	17.4	56400
C3	65163	113007P01	11/20/07	12/03/07	2.50	13500
C4	65164	113007P01	11/20/07	12/03/07	250	414000
C5	65165	113007P01	11/20/07	12/03/07	1.59	23000

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE

APPROVED BY: ch

DATE: 12/4/07

K PRIME, INC.
LABORATORY BATCH QC REPORT

SAMPLE ID: L10260701-S
DUPLICATE ID: D10260701-S
METHOD BLANK ID: B10260701-S
BATCH #: 102607S01
DATE ANALYZED: 12/03/07

METHOD: TOTAL METALS BY ICP/MS
REFERENCE: EPA 3050/6020A

SAMPLE TYPE: SOLID
UNITS: mg/Kg

COMPOUND	MB mg/Kg	SA mg/Kg	SR mg/Kg	SP mg/Kg	SPD mg/Kg	SP %R	RPD %
LEAD	<2.5	100	0.0	108	104	108	3.1

NOTES:
ND: NOT DETECTED
MB: METHOD BLANK
SA: SPIKE ADDED
SR: SAMPLE RESULT
SP: SPIKE RESULT
SPD: SPIKE DUPLICATE RESULT
SP(%R): SPIKE % RECOVERY
RPD: RELATIVE PERCENT DIFFERENCE

Resubmittal

K PRIME, INC.

CHAIN OF CUSTODY RECORD

CONSULTING ANALYTICAL CHEMISTS 3621 Westwind Blvd., Santa Rosa, CA 95403 PHONE: (707) 527-7574 FAX: (707) 527-7879

Client/Project ID	Address/Phone	ANALYSES	KPI Project No.
Allen Matkins - GPI			9952
Project Location	Client Project No.		
Contact	Sampler (Signature)		

Sample Identification No.	Date	Time	Lab Sample No.	Type of Sample	No. of Containers	Crush *	Total Lead						Expected Turnaround Time	Remarks
C2 - White			65162			✓	✓						24 hr	Results
C3 - Red			65163			✓	✓							by 12/4 Jnes-
C4 - Gold			65164			✓	✓							
C5 - Yellow			65165			✓	✓							
														* Test edge
														part only-

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by: (Signature)	Date	Time

Disposal Method	
Disposed by: (Signature) / Date / Time	White Copy : Accompanies Samples Yellow Copy : Sampler

CONFIDENTIAL: ATTORNEY WORK PRODUCT

K PRIME, Inc.

CONSULTING ANALYTICAL CHEMISTS

3621 Westwind Blvd.
Santa Rosa CA 95403
Phone: 707 527 7574
FAX: 707 527 7879

TRANSMITTAL

DATE: 11/21/07

TO: MR. JOHN ALLEN
MS. EILEEN NOTTOLI
ALLEN MATKINS ET AL LLP
3 EMBARCADERO CENTER, 12TH FLOOR
SAN FRANCISCO, CA 94111

Phone: 415-837-1515
Fax: 415-837-1516 213-620-8816
Email: jallen@allenmatkins.com
enottoli@allenmatkins.com

ACCT: 9952
PROJ: GPI-CHIP ANALYSIS

FROM: Richard A. Kagel, Ph.D.
Laboratory Director RAK 11/21/07

SUBJECT: LABORATORY RESULTS FOR YOUR PROJECT GPI-CHIP ANALYSIS

Enclosed please find K Prime's laboratory reports for the following samples:

SAMPLE ID	TYPE	DATE	TIME	KPI LAB #
C1-WA	WIPE	11/20/07	3:30	65152
C1-WB	WIPE	11/20/07	3:30	65153
C1-WC	WIPE	11/20/07	3:30	65154
C2-WA	WIPE	11/20/07	3:30	65155
C2-WB	WIPE	11/20/07	3:30	65156
C2-WC	WIPE	11/20/07	3:30	65157
C3-WA	WIPE	11/20/07	3:30	65158
C3-WB	WIPE	11/20/07	3:30	65159
C3-WC	WIPE	11/20/07	3:30	65160
C4-WA	WIPE	11/20/07	3:30	65168
C4-WB	WIPE	11/20/07	3:30	65169
C4-WC	WIPE	11/20/07	3:30	65170
C5-WA	WIPE	11/20/07	3:30	65171
C5-WB	WIPE	11/20/07	3 30	65172
C5-WC	WIPE	11/20/07	3:30	65173

The above listed sample group was received on 11/20/07 and tested as requested on the chain of custody document.

Please call me if you have any questions or need further information.

K PRIME, INC.
LABORATORY REPORT

METHOD: TOTAL LEAD
REFERENCE: EPA 3050/6020

K PRIME PROJECT: 9952
CLIENT PROJECT: GPI-CHIP ANALYSIS

SAMPLE TYPE: WIPE
UNITS: ug

SAMPLE ID ID	LAB ID #	DATE SAMPLED	BATCH #	DATE ANALYZED	REPORTING LIMIT	SAMPLE CONC
C1-WA	65152	11/20/07	112007WP05	Nov 21 2007	0.100	ND
C1-WB	65153	11/20/07	112007WP05	Nov 21 2007	0.100	ND
C1-WC	65154	11/20/07	112007WP05	Nov 21 2007	0.100	ND
C2-WA	65155	11/20/07	112007WP05	Nov 21 2007	0.100	17.0
C2-WB	65156	11/20/07	112007WP05	Nov 21 2007	0.100	4.04
C2-WC	65157	11/20/07	112007WP05	Nov 21 2007	0.100	1.74
C3-WA	65158	11/20/07	112007WP05	Nov 21 2007	0.100	3.43
C3-WB	65159	11/20/07	112007WP05	Nov 21 2007	0.100	0.424
C3-WC	65160	11/20/07	112007WP05	Nov 21 2007	0.100	0.281
C4-WA	65168	11/20/07	112007WP05	Nov 21 2007	0.100	211
C4-WB	65169	11/20/07	112007WP05	Nov 21 2007	0.100	61.4
C4-WC	65170	11/20/07	112007WP05	Nov 21 2007	0.100	22.5
C5-WA	65171	11/20/07	112007WP05	Nov 21 2007	0.100	9.77
C5-WB	65172	11/20/07	112007WP05	Nov 21 2007	0.100	1.04
C5-WC	65173	11/20/07	112007WP05	Nov 21 2007	0.100	0.615

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE

APPROVED BY: _____

DATE: 11/21/07

K PRIME, INC.

LABORATORY BATCH QC REPORT

SAMPLE ID: L11200705-WIPE
DUPLICATE ID: L11200705-WIPE
METHOD BLANK ID: B11200705
BATCH ID: 112007WP05
METHOD: METALS
SAMPLE TYPE: WIPE
REFERENCE: EPA 3050/6020
UNITS: µg/wipe

COMPOUND	MB	SA	SR	SP	SPD	SP %R	RPD %
LEAD	ND (<0.1)	4.00	0.0	4.41	4.41	110	0.0

NOTES:

ND:	NOT DETECTED
MB:	METHOD BLANK
SA:	SPIKE ADDED
SR:	SAMPLE RESULT
SP:	SPIKE RESULT
SPD:	SPIKE DUPLICATE RESULT
SP(%R):	SPIKE % RECOVERY
RPD:	RELATIVE PERCENT DIFFERENCE

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY**	Page 6 of 7
		Project: Chip Analysis	Method of Shipment: Courier
		Telephone No.: (510)268-5007 (510)268-5099	Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)
GB-1	65145					x			11/20/2007	9:45	x
GB-2	65146					x			11/20/2007	4:00	x
BW-1	65147					x			11/20/2007	9:45	x
BW-2	65148					x			11/20/2007	4:00	x
UW-1	65149					x			11/20/2007	9:45	x
UW-2	65150					x			11/20/2007	9:45	x
UW-3	65151					x			11/20/2007	9:45	x
C1-Wa	65152					x			11/20/2007	3:30	x
C1-Wb	65153					x			11/20/2007		x
C1-Wc	65154					x			11/20/2007		x
C2-Wa	65155					x			11/20/2007		x
C2-Wb	65156					x			11/20/2007		x
C2-Wc	65157					x			11/20/2007		x
C3-Wa	65158					x			11/20/2007		x
C3-Wb	65159					x			11/20/2007		x
C3-Wc	65160					x			11/20/2007	↓	x

Special QA/QC

REMARKS

Sample Received Intact. Yes No

Temperature received. Ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)	Lab Work No.
Emily Goswami	11/20/07	5:00	Exol (KTC) 11/20/07 550	
Relinquished by: Exol (KTC)	Date: 11/20/07	Time: 20:25	Received by:	
Relinquished by	Date	Time	Received by laboratory	Time

K-Prime 3621 Westwind Blvd. Santa Rosa, CA 95403 (707) 527-7574 phone (707) 527-7879 fax	Client: **Exponent, Inc.** 500 12th Street, Suite 220 Oakland, CA 94607 Project Manager: Renee Kalmes, CIH	**CHAIN of CUSTODY**	Page 7 of 7 Method of Shipment: Courier
		Project: Chip Analysis Telephone No: (510)268-5007 (510)268-5099	Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Solid	Water	Air	Wipe	Prsv.: Yes	No	Sampling Date	Sampling Time	Pb (EPA 3050/ 6020)	
C1	65161		x						11/20/2007	3:30	~~x~~ ~~HOLD~~	
C2	65162		x						11/20/2007		x	
C3	65163		x						11/20/2007		x	
C4	65164		x								x	ANALYZE
C5	65165		x								x	
C6	65166		x								~~HOLD~~	
C7	65167		x								~~HOLD~~	
C4-Wa	65168					x					x	
C4-Wb	65169					x					x	
C4-Wc	65170					x					x	
C5-Wa	65171					x					x	
C5-Wb	65172					x					x	
C5-Wc	65173					x					x	
D-1	65174				x						x	

Special QA/QC

REMARKS: CHIP+INLAY CAM17 ~~SEPARATE~~ [Changes per Eileen 11/21/07 pm]

Sample Received Intact: Yes No

Temperature received: Ice

Relinq by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)	
Emily Goswami	11/20/07	5:00	(VTC)	11/20/07 5:50
Relinquished by (VTC)	Date 11/20/07	Time ~~20:25~~	Received by	
Relinquished by	Date	Time	Received by laboratory	20:25 Time

Lab Work No.

EMS LABORATORIES INC.
FAX MEMO
CONFIDENTIAL

No. Pages: 3 (including this page) Date: 11-21-07

Attention: Renee Kacmes

Company: Exponent

Fax Number: 510-268-5099

Submitted By: Lei Wang, Ph.D./QA Manager

Subject: Lab Report 117558

Remarks:

Response Requested: Yes: _____

Telephone Number (626) 568-4065 Fax Number (626) 796-5282

Note: The results of the analysis are based upon the samples submitted to the laboratory. No representation is made regarding the sampling area other than that implied by the analytical results for the immediate vicinity of the samples analyzed as calculated from the data presented with those samples.

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SUBMITTAL FORM/Laboratory Services # 117558

PAGE 1 OF 1

TURNAROUND TIME: STD ___ 48 HR. ___ 24 HR. ___ <8 HR. ___ WKND ___ OTHER Same Day

- RELINQUISHED BY [signature]
- TIME / DATE 11/20/07 – 5:00 pm
- CLIENT Reneé Kacner Exponent
- DATE OF SHIPMENT 11/20/07
- CARRIER Fed Express
- ADDRESS 500 12th Street, S. 220 Oakland CA 94607
- CLIENT P.O. NO.
- CLIENT JOB/PROJECT ID NO(S). 0703377.000 Y0T0
- TELEPHONE (510) 268-5007
- CONTACT Renee Kacmes
- PACKAGE SHIPPED FROM Menlo Park, CA
- RESULTS REQUESTED VIA VERBAL ☐ FAX ☒
- CLIENT FAX NO. rkacmes@exponent.com FAX (510) 268-5099

(NOTE: Complete written reports will follow all analyses, in addition to any prior transmitted verbal or fax results.)

- DATE/TIME OF SAMPLE COLLECTION 11/20/07
- SAMPLE PRESERVATIVES MCE Filters HOLDING TIMES
- NO. OF SAMPLES SENT 6 SAMPLER'S NAME Renee Kacmes / SIGNATURE PRINTED
- TYPE: ☐ WATER ☐ WASTE WATER ☐ SOIL ☒ FILTER ☐ SORBENT TUBE ☐ IMPINGER ☐ OTHER

(FOR EMS ONLY) EMS Sample No.	CLIENT SAMPLE NO.	DESCRIPTION LOCATION/ANALYSIS		VOLUME TIME/WEIGHT IF APPLICABLE
117558-1	~~D-1~~	~~Lead NIOSH 7105~~	Requested	
-2	D-2	Lead NIOSH 7105	L.O.D. 0.03 ug	1037 liters
-3	D-3	graphite furnace	↓	1081 liters
-4	D-4	↓	↓	1085 liters
-5	D-5	↓	↓	1058 liters
-6	D-6	↓	↓	blank

extra blank also provided – only Analyze one blank

(SF 5/00)

FOR EMS ONLY

- Laboratory No. 117558
- Received By [signature]
- Time 11:10
- Date of Package Delivery 11/21/07
- Shipping Bill Retained: YES ☐ NONE ☒
- Condition of Package on Receipt OK
- Condition of Custody Seal

(NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact the project manager and the shipper.)

- No. of Samples 6
- Chain-of-Custody Signature [signature]
- Date of Acceptance into Sample Bank 11.21.07
- Misc. Info.
- Disposition of Samples [illegible]

EMS LABORATORIES 117 West Bellevue Drive / Pasadena CA 91105-2503 / 626-568-4065

EMS LABORATORIES CHEMISTRY REPORT

CLIENT: Exponent
LABORATORY NO: 117558
PROJECT NO: 0709377000 BOTO

ANALYTE: Lead
METHOD: NIOSH 7105

DATE RECEIVED: 11-21-07
DATE ANALYZED: 11-21-07

DETECTION LIMIT: 0.03 (µg)

Sample ID	Pb Weight (µg)	Air Volume (Liter)	Pb Concentration (µg/m^3)
D-2	<0.03	1037	<0.03
D-3	<0.03	1081	<0.03
D-4	<0.03	1085	<0.03
D-5	<0.03	1058	<0.03
D-6	<0.03	Blank	N/A

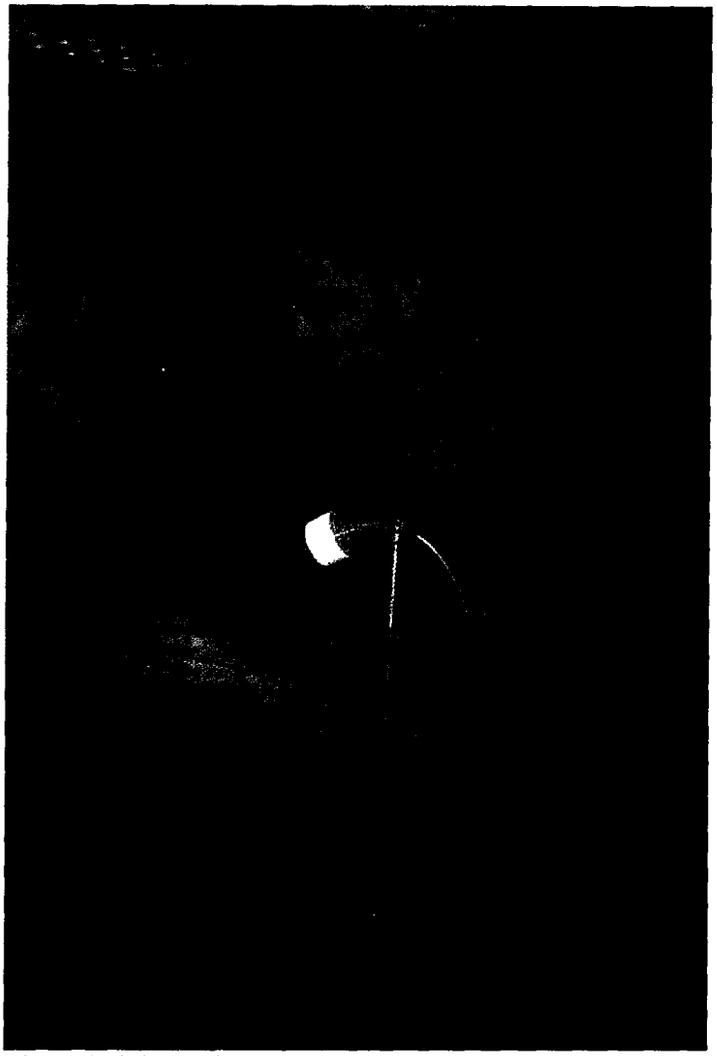
NA: Not Applicable

Chemist
Simona Fish

Attachment D

Study Photos

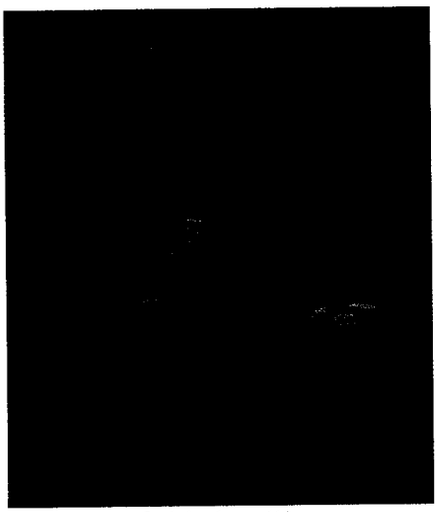
Subjects playing Blackjack.



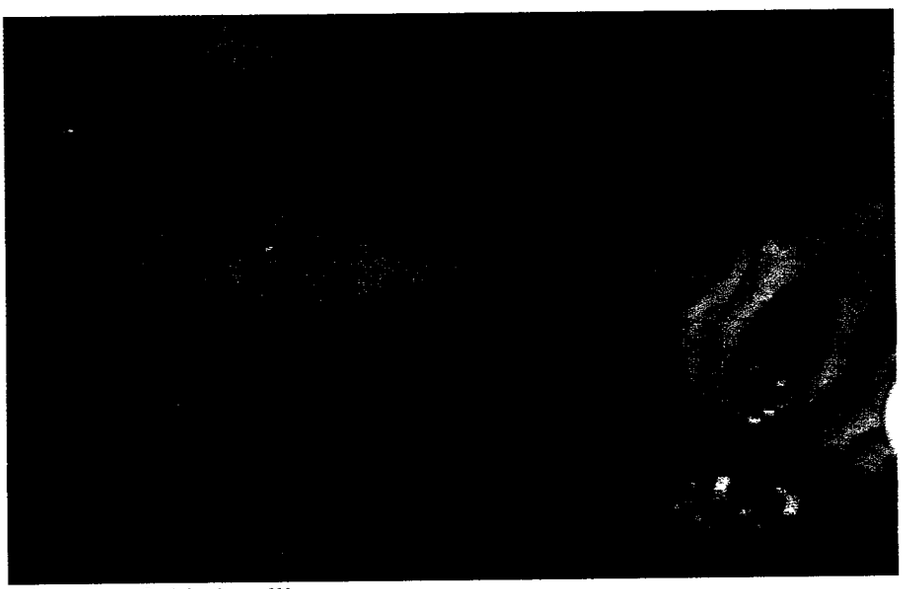
Player holding chips; placement of air monitor.

Close up of chip handling.

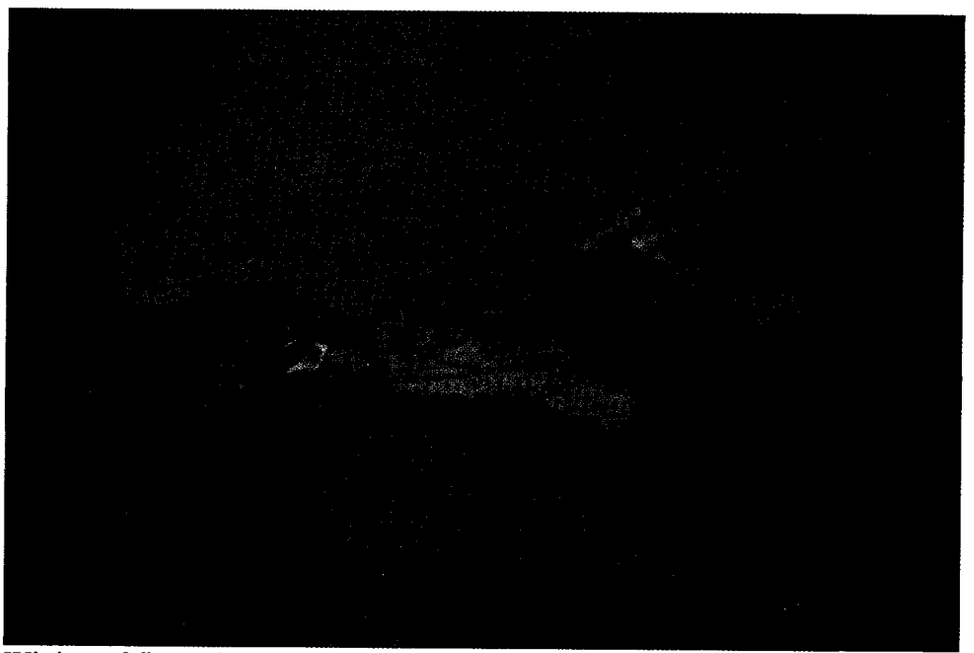
Close up of chip handling.



Close up of chip handling.



Close up of chip handling.



Wiping of fingertips.